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ASSESSMENT AND PLANNING DIVISION

APD Bulletin 8

BIOPHYSICAL RESOURCES OF THE EAST KOOTENAY AREA :
OUTDOOR RECREATION

L.E. (Beth) Collins
TERRESTRIAL STUDIES BRANCH

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PREFACE

This report is one of a series of Assessment and Planning Division (APD)[1] bulletins that describes and analyzes the biophysical resources of the East Kootenay area. Individual bulletins focus on terrain, soils, climate, vegetation, wildlife, aquatics, and outdoor recreation, but are closely interrelated and rely on cross-referencing rather than duplication of material. A set of base data maps at 1:50 000 is also available for each discipline.

The East Kootenay study was initiated in 1975 in response to increasing pressure on land resources and the development of land-use conflicts. Forestry, mining, ranching, farming and tourism are all major contributors to the economic well-being of the region. General population growth and maintenance of these industries requires that land be allocated for urban and industrial expansion and transportation corridors, and yet at the same time, areas be preserved for wildlife and recreational purposes.

The data, analyses, and interpretations that are contained within the East Kootenay bulletin and map series will assist in the development and implementation of a rational resource management policy. In addition, information is presented here that will increase systematic knowledge of the physical and biological components of land and water systems.

It is anticipated that careful utilization of this data base will ultimately result in the maintenance of a high quality environment in this part of British Columbia.

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[1] Formerly Resource Analysis Branch, Ministry of Environment.

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Chapter One

Chapter One

INTRODUCTION

1.1 STUDY BACKGROUND

The Terrestrial Studies Branch, Ministry of Environment, has recently completed an outdoor recreation features inventory mapping project in the East Kootenay region (Figure 1). This part of southeastern British Columbia has a number of outstanding attractions that have made it a popular recreation area. These include the Rocky Mountain Trench, the Rocky Mountains, the Columbia-Windermere Lakes recreation area, angling and big-game hunting, hot springs, mountain wilderness hiking and camping, winter sports, and historical aspects related to early settlement.

In recent years, land-use conflicts have arisen which are potentially damaging to outdoor recreation resources. In order to preserve the recreation potential of this area, future land-use plans for the East Kootenay region should incorporate the results of this inventory of outdoor recreation features.

In 1965, the East Kootenay region was mapped for recreation capability (Yeomans, 1966) according to the Canada Land Inventory (C.L.I.) system as a pilot project. The C.L.I. programme for land resource capability was established as a joint Federal-Provincial undertaking under the Agricultural Rehabilitation and Development Act (A.R.D.A.). As part of the East Kootenay resource inventory programme initiated in 1975, the recreation features inventory has been updated according to the method used by the Resource Analysis Branch (Block and Hignett, 1976).

Since 1965, a number of resource studies have been carried out in the East Kootenay region by C.L.I., A.R.D.A., and Resource Analysis Branch (R.A.B.). The studies listed in Appendix A pertain to, or have sections pertaining to, the outdoor recreation resource, and may be of interest to the reader. Copies of most of these may be obtained from the Map Library, Assessment and Planning Division, Ministry of Environment, Parliament Buildings, Victoria, B.C., V8W 1X4.

This report gives the results of the outdoor recreation features inventory and some physical carrying capacity information for outdoor recreation of the East Kootenay region. It is one of

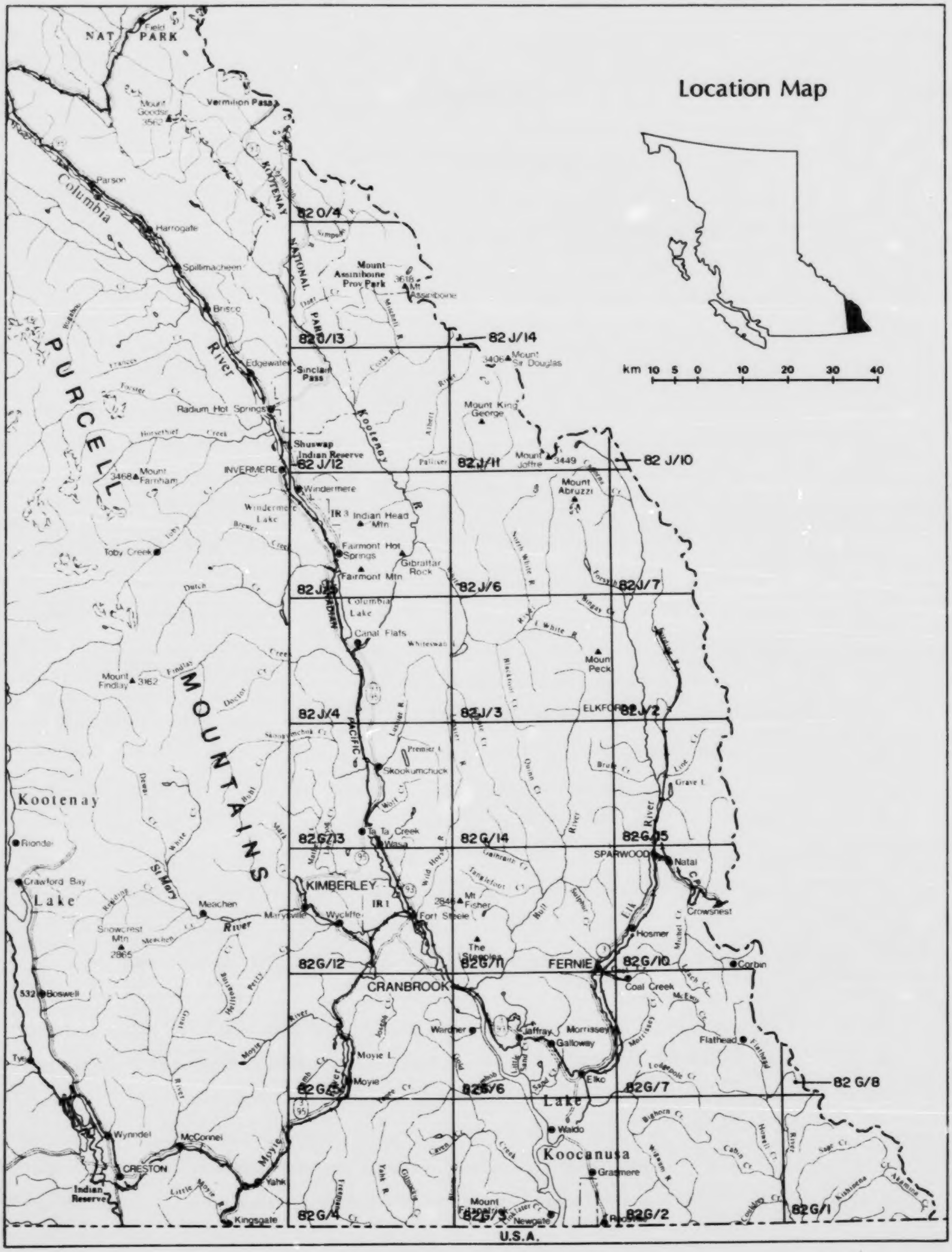
Location Map
km 10 5 0 10 20 30 40
NAT PARK
Field
Vermilion Pass
Mount Goodsir 3562
KOOTENAY NATIONAL PARK
82 O/4
Mount Assiniboine Prov Park
3618 Mt Assiniboine
82 O/13
82 J/14
3406 Mount Sir Douglas
Sinclair Pass
Mount King George
Mount Joffre 3449
82 J/10
82 J/12
82 J/11
Mount Abruzzi
Shuswap Indian Reserve
INVERMERE
Windermere
Windermere Lake
IR 3
Indian Head Mtn
Fairmont Hot Springs
Gibraltar Rock
Fairmont Mtn
82 J/5
82 J/6
82 J/7
Columbia Lake
Canal Flats
Mount Peck
Kootenay R
Columbia River
Parson
Harrogate
Spillimacheen
Brisco
Edgewater
Radium Hot Springs
PURCELL MOUNTAINS
3468 Mount Farnham
Toby Creek
Mount Findlay 3162
82 J/4
82 J/3
ELKFORD
82 J/2
Skookumchuck
Ta Ta Creek
Wasa
82 G/13
82 G/14
82 G/15
SPARWOOD
Natal
Crowsnest
Kootenay Lake
Riondel
Crawford Bay
St Mary River
Meachen
Marysville
Wycliffe
KIMBERLEY
IR 1
Fort Steele
2846 Mt Fisher
The Steeples
Snowcrest Mtn 2865
Hosmer
82 G/12
82 G/11
FERNIE
82 G/10
Corbin
CRANBROOK
Coal Creek
Boswell
Wardner
Jaffray
Morrissey
Galloway
Flathead
Moyie L.
Moyie
Elko
82 G/5
82 G/6
82 G/7
82 G/8
Tye
Wynndel
McConnell
CRESTON
Indian Reserve
Yahk
Kingsgate
Waldo
Lake Koocanusa
Grasmere
Mount Fernie
Newgate
Roosville
82 G/4
82 G/3
82 G/2
82 G/1
Elk River
U.S.A.

Figure 1: Location of East Kootenay Biophysical Study Area

several volumes in a series of bulletins entitled "Biophysical Resources of the East Kootenay Area" which comprise the East Kootenay resource inventory study.

1.2 OBJECTIVES AND APPLICATIONS

The main objective of this outdoor recreation features inventory was to identify and evaluate the type and quality of the physical and biological aspects of the East Kootenay region that are of recreational interest and value. This was done according to a Provincial recreation capability mapping scheme outlined in Chapter Two. The analysis of an entire region carried out in this manner provides a comparative recreation resource data base so that recreation features can be evaluated in terms of quality, quantity and distribution.

This report provides:

1. background information about the natural landscape and recreational resource values on a regional basis.
2. a description of specific areas of high recreational significance in the region; and
3. comments on those areas with high recreational value which require immediate consideration in land management plans for the region.

It is not intended that this report should identify in detail all the information which is presented graphically on the 1:50 000 scale Outdoor Recreation Features maps. Rather, it should be used in conjunction with the maps as an extension of the mapping programme in order to explain the methods used and to highlight the unique or interesting aspects of significant outdoor recreation features.

The outdoor recreation components of the landscape are a natural resource that can be defined and delineated on a map in a manner similar to other recognized natural resources. Recreation information provided by this project should serve as a useful resource input into future land management and planning programmes in the East Kootenay area. It will allow planning and management agencies concerned with recreation to locate, identify and compare areas of recreational significance for development, preservation, and/or acquisition.

1.3 REGIONAL OVERVIEW

1.3.1 PHYSIOGRAPHY

The East Kootenay project area contains three broad physiographic units: the Rocky Mountains (subsequently referred to as "the Rockies"); the Purcell Mountains; and the Rocky Mountain Trench (subsequently referred to as "the Trench") (Figure 2).

The Rockies consist of numerous elongated ranges of rugged, mountainous terrain that are aligned roughly from north-northwest to south-southeast. Elevation differences between peaks and adjacent valleys range from 750 to 1850 metres (2460 to 6068 feet) and summit elevations lie between 2000 and 3600 metres (6560 to 11 708 feet) above sea level. Relatively resistant rock formations such as limestone*, dolomite* and quartzite* are widespread in the Park, Kootenay and portions of the Front Ranges. They form tall peaks which are surrounded by steep ridges and high cliffs. Within the same area, where less resistant rock such as shale* and phyllite* outcrop, the terrain is characterized by broad eroded valleys such as those of the Kootenay (north of Gibraltar Rock), White and Upper Elk Rivers. The Fernie and Flathead Basins are structural depressions with downfolded and downfaulted rocks.

The Purcell Mountains in the Study Area have relatively subdued topography and lack the dramatic cirques* or peaks of the Rockies; their broad, rounded summits rise to 2200 metres (7200 feet) above sea level. Quartzite, limestone and argillite* are the chief rock types in this area. The main ranges of the Purcells lie further west.

The Trench is a broad downfaulted lowland of flat to hilly terrain at 760 and 1060 metres (2493 and 3477 feet) in elevation. It is 3 to 16 km wide and consists of undulating drift* terrain with occasional bedrock hills, crossed by shallow, flat-floored valleys. It is bounded to the east by a fault scarp* which constitutes a visually spectacular mountain front such as at the Steeples and Mount Fisher in the Hughes Range. Since it is flanked on either side by high mountain ranges, the Trench is one of the most significant viewing corridors in the Province. It is drained by the Kootenay River in the south and the Columbia River in the north. The broad Kootenay Valley grasslands of the south are separated from the extensive wetlands of the upper Columbia Valley by the Columbia-Windermere Lake and marsh* system.

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* See Glossary (Appendix H) for definition. Words defined in the Glossary are indicated where they appear for the first time in each chapter.

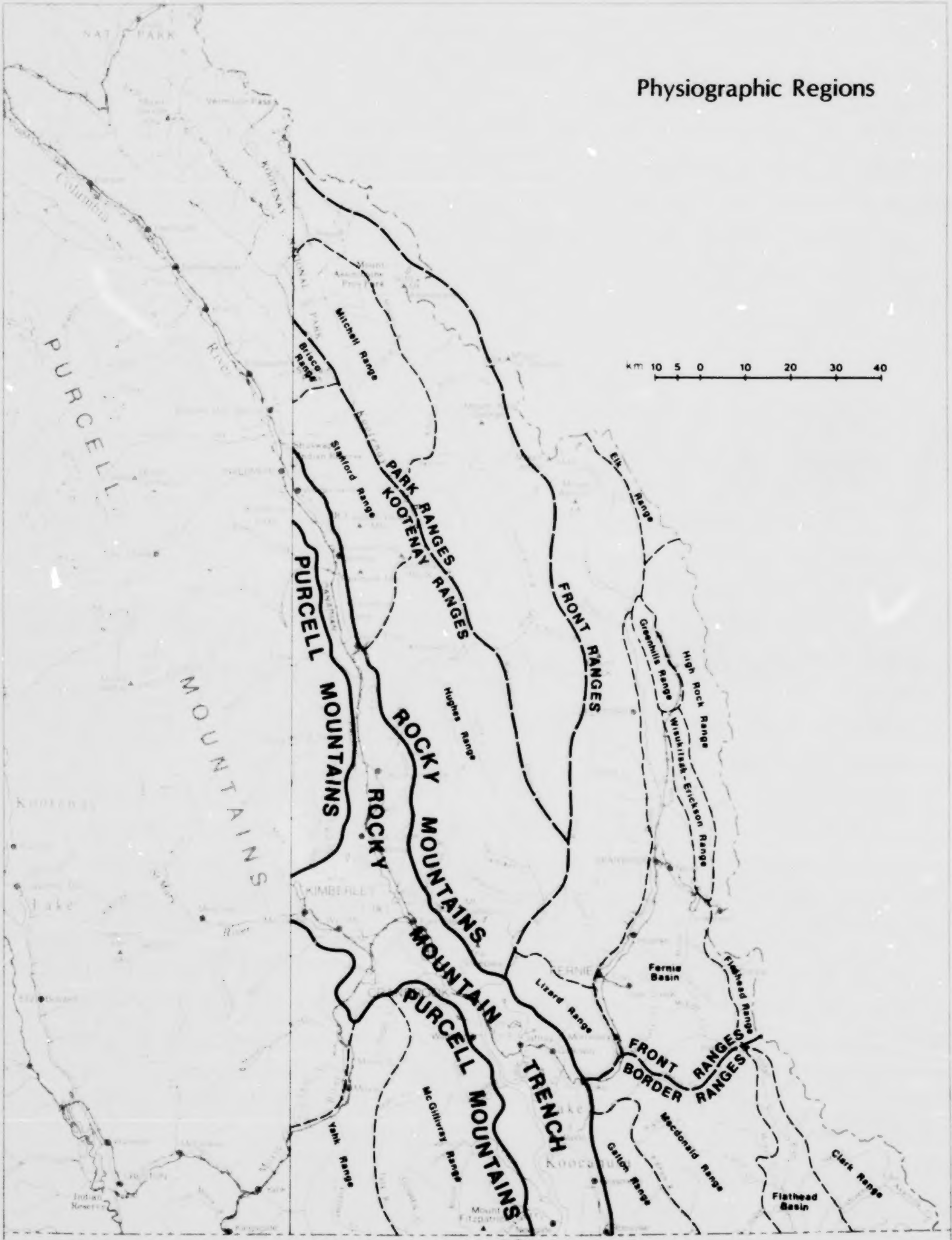
Physiographic Regions
km 10 5 0 10 20 30 40
PURCELL MOUNTAINS
PURCELL MOUNTAINS
ROCKY MOUNTAINS
ROCKY MOUNTAIN TRENCH
PURCELL MOUNTAINS
PARK RANGES
KOOTENAY RANGES
FRONT RANGES
FRONT RANGES
BORDER RANGES
Brisco Range
Mitchell Range
Stanford Range
Hughes Range
Elk Range
Greenhills Range
High Rock Range
Wisukitsak-Erickson Range
Lizard Range
Fernie Basin
Flathead Range
Macdonald Range
Galton Range
Clark Range
Flathead Basin
McGillivray Range
Yahk Range
KIMBERLEY
FERNIE
Koocanusa
Mount Fitzpatrick
U.S.A.

Figure 2: Physiographic Regions (after Holland, 1964)

This present day landscape represents the results of geological processes* that have been taking place over millions of years. The general pattern of mountain ranges and valleys was formed before the onset of Quaternary* glaciations, two or three million years ago. Most of the present day landforms, however, are the result of erosion and deposition that has occurred during the past 20 000 years. Fresh-appearing glacial troughs and cirques were vacated by ice no more than 12 000 years ago, and most river canyons, terraces and waterfalls have formed since that time.

Landforms of particular recreational interest are discussed in Chapter Three within specific area descriptions. For a comprehensive description of the geology of the Study Area, see East Kootenay terrain maps and report in the East Kootenay bulletin series.

1.3.2 CLIMATE

The East Kootenay region is characterized by hot summers, with sporadic rain shower activity, and winters which vary annually from mild to severe. Climatic variations occur within the region. Warmer, drier conditions are evident in the Trench (mean annual precipitation in the Trench is approximately 400 to 500 mm) and cooler, wetter conditions in the side valleys and at higher elevations in the Rockies and Purcell Mountains. The windward side of these two mountain ranges experiences greater amounts of cloud and precipitation, both of rain and snow, than do the lee or eastward facing slopes.

Local climate is controlled mainly by topography. The relatively dry climate is the result of the predominant westerly airflow losing the majority of its moisture on mountain ranges west of the Trench. Climatic variations as a result of aspect and elevation changes are significant throughout the East Kootenay region. Southerly aspects receive the greatest amounts of solar radiation. Consequently, temperatures are generally warmest, snow cover the least prolonged and drought conditions most extreme in these locations. Northerly aspects have the exact opposite situation, and east and west aspects have intermediate characteristics. Climate becomes increasingly cool and wet upslope resulting in substantially greater amounts of snowfall, thicker snowpacks, and a much more prolonged snow season.

Wind should be regarded as a predominant factor throughout the region as far as the effect of climate on recreation in concerned. Winds within the valley have a tendancy to blow predominantly north or south due to the orientation of the main valleys, and tend to increase in velocity upslope.

In areas cleared of vegetation and in most high elevation mountain areas, winds are inclined to blow and drift snow. Winter activities such as snowshoeing, skiing (both downhill and cross-country) and snowmobiling depend on continuous good quality snow cover. In lighter snowfall areas, snow-oriented recreational activities may be limited for much of the winter in exposed areas and on south-facing slopes. High winds, combined with very cold temperatures, result in increasing chill factor. High ridges and exposed valley locations are two such areas where this may occur. However, wind can have a beneficial cooling effect during extremely warm summer weather conditions. Areas along lake shores and vegetated sites benefit from such cooling winds and shade during the warm summer months.

The climatic variety within the region, accentuated by well-defined seasonal changes, increases the variety of recreational activities that can be enjoyed during the year. More comprehensive information regarding climate parameters for the study area, in the form of maps and the climate report of this East Kootenay bulletin series, will be published in the near future by the Air Studies Branch following completion of data analysis for the East Kootenay climate network*.

A Resource Analysis Branch published report (Bennett, 1977) provides information regarding climate suitability for recreation for many of the Atmospheric Environment Service (AES) stations in British Columbia.

1.3.3 VEGETATION

The East Kootenay contains three very broad vegetation patterns: the open grasslands and forest parklands of the Trench; forested mountain slopes and side valleys; and the upper subalpine areas and alpine ridges of the Rockies and Purcell Mountains. For a comprehensive description of vegetation and vegetation zonation in the study area, refer to the East Kootenay vegetation maps and report of the East Kootenay bulletin series.

Throughout the lower elevations of the Trench the vegetation is characterized by parklands of ponderosa pine with various amounts of Rocky Mountain Douglas-fir, which are interspersed with grassy areas. Forests of lodgepole pine, western larch and trembling aspen occur adjacent to the parklands and on lower elevation mountain slopes. Extensive areas of open grassland are found in the southern Trench as well as in the Skookumchuck-Wasa Lake area. This vegetative pattern is particularly attractive visually, and is ideally suited to camping, picnicking, viewing, horseback riding, cross-country skiing and sightseeing by vehicle.

Above the Trench floor, the vegetation is generally characterized by closed-cover forests. A change from the lower elevation Rocky Mountain Douglas-fir forests to the Engelmann spruce - alpine fir forests is evident above approximately 1300 metres (4250 feet). Other common tree species at this elevation include lodgepole pine, western larch and trembling aspen. Whitebark pine and alpine larch are found above 1530 metres (5000 feet). These add variation in type and contrast in colour during the fall season when western larch, alpine larch and trembling aspen turn brilliant shades of yellow. Such contrasts provide an important component of the viewing corridor within the valley system.

In areas west of Moyie Lake, and scattered throughout the southern part of the region, forests contain components of western hemlock and western red cedar similar to the dense Interior Wet Belt forests of the West Kootenay area. Upland forests are of relatively uniform colour and texture, and are not highly significant with respect to specific recreational attractions, although variation is provided by less densely vegetated south-facing slopes and rocky environments throughout the area. Hiking, viewing, horseback riding, cross-country skiing, snowmobiling and hunting are among the recreation activities associated with these forested areas.

Upper subalpine environments of the East Kootenay region, usually found on ridges and in cirque basins above 2200 metres (7200 feet), are characterized by open forests, meadows and krummholz* vegetation dominated by alpine fir with lesser amounts of Engelmann spruce, alpine larch and whitebark pine. Extensive alpine meadows are found in the Mount Assiniboine Park area. Wildflowers, flowering shrubs and alpine larch add to the beauty of these landscapes which provide significant recreational opportunities for hiking, viewing, photography, wilderness camping and wildlife observation. These environments are generally fragile and subject to deterioration from intensive recreational use such as campsite developments.

Specific vegetation features often provide diversity and visual attractiveness to the landscape in which they occur. Avalanche chutes, present on most steep-sided valleys, support a variety of grasses, wildflowers and deciduous shrubs which enhance viewing corridors with their contrasts in colour, texture and pattern. Wetland fens* and marshes* occur on floodplains and lakeshores. These provide numerous opportunities for nature observation in areas which are most accessible to the general public. Additional vegetation features associated in particular with the floodplain* of the Kootenay River near Wasa Lake and the gullies* in lacustrine* terraces of the Trench, are stands of trembling aspen and black cottonwood (poplar) which provide variation in colour particularly during autumn. White spruce is frequently found on floodplain areas. Pastoral landscapes represented by cleared fields from past and present agricultural activities, are seen throughout the Kootenay, Columbia, Elk and Moyie River valleys. Terraces along tributary valleys provide good areas for viewing.

1.3.4 WILDLIFE[1]

Wildlife values for the East Kootenay region are the highest in the Province (Lands Directorate, 1976), and the region may even support more prolific and varied herds of big game species than any other comparable area in North America (Benson, 1970, and Pearse and Bowden, 1966). In general, it is the juxtaposition of extensive areas suitable for use as winter ranges*, and extensive areas of subalpine habitat suitable for use as summer range* that provides the necessary major habitat requirements for so many big game species.

Rocky Mountain elk, the most prolific of the big game species, winter in all the major valley bottoms, especially the Rocky Mountain Trench. They summer throughout the subalpine forests and alpine basins. Mule deer, while not nearly as prolific as elk, are just as widespread; they winter mainly in the Trench and summer throughout the subalpine forests and alpine basins. White-tailed deer also winter mainly in the Trench but summer in areas in the Trench, immediately adjacent to it or along the floodplains and lower terraces of the major river valleys. Moose are found wintering mainly in the major valley bottoms away from the Trench. They summer in the forests and valley bottoms adjacent to their winter range. Rocky Mountain bighorn sheep winter on a few exposed ridges and terraces on the east side of the Trench or on a few windswept, high-elevation grasslands or alpine slopes in the Rocky Mountains. They summer in the mountains in the subalpine and alpine environments adjacent to their winter ranges. Mountain goats are found on the rugged mountain tops and ridges of the Rocky Mountains and in only a few areas of the Purcell Mountains in the study area. They winter on the exposed ridges, bluffs, and slopes of the mountains. A few scattered herds of woodland caribou are found in the subalpine forests of the Moyie Range of the study area.

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[1] Demarchi, D.A., personal communication.

Black bears are scattered throughout the study area and grizzly bears are found mainly in the side valleys, subalpine forests and alpine basins. Cougars are found mainly in the Trench or in association with deer winter ranges. A few wolves are located in some of the more remote watersheds* of the region.

The landscape and vegetation diversity of the East Kootenay provide a variety of habitat for many species of birds. Migratory waterfowl and upland game birds abound in the Trench area. The Columbia Lake marshes and the Kootenay Valley wetlands* are significant staging areas* for waterfowl. As well, the dryland grass/shrub habitat provides excellent nesting habitat for many species of passerine* birds.

1.4 OUTDOOR RECREATION RESOURCE OVERVIEW

The following describes briefly the kinds of recreational opportunities that exist within the study area.

The East Kootenay, compared with other regions of British Columbia, is one of the most valuable with regard to overall scenic quality and opportunities for outdoor recreation. Four large parks are located within the study area: Kootenay National Park, and Mount Assiniboine, Elk Lakes and Top of the World Provincial Parks. These parks are all representative of the Rockies in terms of angular rocky ridges and krummholz-alpine scenery, and are heavily used by tourists as well as by local residents for camping, picnicking, hiking and viewing. A number of smaller provincial parks, such as Wasa, Premier and Whiteswan Lakes, which provide picnicking and camping opportunities have also been developed. Forest recreation sites have been established by the Forest Service and offer basic facilities such as pit toilets and picnic tables. Fort Steele, a highly developed historic park which is managed by the British Columbia Parks and Outdoor Recreation Division, attracts a large number of tourists to the region.

1.4.1 WATER-ORIENTED FEATURES AND ACTIVITIES

Many of the lakes within the East Kootenay region are located in the Trench and are a significant component of the viewing landscape, particularly those which lie adjacent to transportation corridors. The largest lakes in the region are: Columbia, Windermere, Moyie, Grave, Premier, Whiteswan, Wasa, Tie, Rosen and Koocanusa (Libby Reservoir). These lakes and their shorelands all receive fairly heavy recreational use particularly during the summer months, through angling, power boating, water-skiing, wind surfing, canoeing, picnicking, camping and cottaging activities. Swimming activities also take place in most of these lakes but are limited to relatively select shoreline areas because of the presence of aquatic weeds, fine-textured bottom material (muddiness), and a lack of sandy beach areas.

Most of the small lakes found in the region are associated with wetland areas that provide birdwatching and wildlife observation opportunities. Other lake-related activities are much the same as mentioned for the larger lakes with the exception of power-boating and water-skiing.

A distinctive feature of a substantial number of East Kootenay lakes is their attractive aquamarine colouration. This is caused by the reflection of sunlight from clay-sized sediments suspended in the water.

The study area supports a significant sport fishery, mainly in the river systems of the Kootenay, Elk, Columbia, Moyie and Flathead. The most common species include cutthroat trout, rainbow trout, Dolly Varden char and mountain whitefish. A number of small lakes are stocked regularly by the British Columbia Fish and Wildlife Branch, usually with rainbow trout. Angling takes place almost year-round as ice-fishing is a popular winter sport. Generalized maps at 1:700 000, prepared by the Aquatic Studies Branch, Ministry of Environment, show the distribution and abundance of the major sport fish species (see Appendix D). More detailed 1:50 000 aquatic maps are available from the Map Library, Assessment and Planning Division, Ministry of Environment, Parliament Buildings, Victoria, B.C., V8W 1X4.

A number of hot springs* and mineral springs are also found within the study area. Fairmont and Radium are two commerically developed hot springs of major tourist importance. There are at least three additional undeveloped hot springs suitable for bathing which are used by local residents. Small mineral springs and seepage areas are common in the East Kootenay and are used by wildlife as "mineral licks"*.

The East Kootenay area also has many rivers such as the Kootenay, Flathead, Elk, and Moyie Rivers and Columbia River from the south shore of Columbia Lake up to Donald Station, which provide significant opportunities for canoeing, kayaking, nature viewing and camping on their shorelands. There are many attractive waterfalls in the area also and while none are of exceptionally high significance, they add visual variety to the landscape.

1.4.2 LAND-ORIENTED FEATURES AND ACTIVITIES

Landscape diversity, combined with a favourable climate, are the major factors contributing to the high quality land-oriented recreational attractions of the study area. The variety of plant communities and individual species which are found in the East Kootenay region allows for recreational activities which may range from cross-country skiing in the winter to edible plant and berry collecting in the summer and fall months. Vegetation species of recreational interest have been documented by the Vegetation Section of the Terrestrial Studies Branch (see Appendix F).

The wildlife resources of the study area provide excellent opportunities for hunting, trapping and viewing. Hunting is one of the most significant recreational activities in the area. It attracts people from many parts of the province, the rest of Canada, the United States and, more recently, from Europe. It is of major economic importance to the region.

The high scenic quality of the Rockies encourages significant mountaineering activities. The Trench and most of the major side valleys provide excellent opportunities for a variety of family recreation activities such as camping and horseback riding. Downhill ski developments have been established in Fernie, Kimberley, Fairmont, Invermere and Elkford, and numerous old logging and mining exploration roads in the region provide areas suitable for snowmobiling and cross-country skiing. Hang-gliding has also become an increasingly popular sport and usually takes place from some of the mountain peaks adjacent to the Trench.

Although "viewing" or "sightseeing" is a more passive activity, it is probably the main recreational pursuit of most visitors to the East Kootenay region.

1.4.3 HISTORIC FEATURES

The East Kootenay area is of high significance with regard to both native Indian and pioneer history. Early use of the region by the Kootenai (also spelled Kootenae, Kootenay) and Shuswap

Indian groups related mainly to hunting, horse grazing, and fishing opportunities. Remnants of numerous camps and trails can be found throughout the region. Pictographs* and petroglyphs* have been found at many sites and documented by the British Columbia Heritage Conservation Branch. These heritage resources, it should be noted, are protected under the Heritage Conservation Act. They are discussed in this report in order to provide important planning information.

Early pioneer history centres around the exploration of the Continental Divide, the fur trade, and the gold rush days of the 1860s. David Thompson and James Sinclair were among the early white explorers of this area. Trading posts were established by the Hudson's Bay and/or North West Companies at Toby Creek, Galbraith's Ferry, Tobacco Plains and Perry Creek. The Wild Horse River, terminus of the Dewdney Trail, was the site of greatest activity during the 1864 gold rush, but gold was also panned in Perry, Toby, Findlay, Palmer Bar, Gold and Nigger Creeks, and in Moyie River.

Remnants of many small logging and mining mills, and settlements can still be seen today. Remains of paddle wheel steamboats in the Upper Columbia River, the Baillie-Grohman Canal at the south end of Columbia Lake, and the occasional abandoned railway bed represent early transportation ventures. Many old log cabins and small abandoned farmland sites characterize the region and provide historic and viewing interest.

Chapter Two

Chapter Two

DESCRIPTION OF METHODS FOR OUTDOOR RECREATION CAPABILITY INVENTORY

2.1 INTRODUCTION

Land capability can be defined as the ability of land to support a land-use at a specific level of management or performance. Two functions of the outdoor recreation capability inventory programme (Block and Hignett, 1976) are:

1. to classify the land and water for outdoor recreation values (designation of map units on the basis of recreation features); and
2. to assess the inherent limitations of the land and water which will affect outdoor recreational use (inventory of physical carrying capacity for outdoor recreation).

2.2 OUTDOOR RECREATION FEATURES

Recreation features are natural aspects of land and water which provide opportunities for outdoor recreation. The mapping of recreation features in the East Kootenay region follows the methods established by the Resource Analysis Branch, which are described in Recreation Capability Inventory (Block and Hignett, 1976). These methods entail the description, in map form, of naturally occurring features according to 68 different sub-feature categories in order to provide as specific an identification as possible.

Appendix B lists the sub-feature categories which comprise the inventory and describes other inventory conventions used in mapping the East Kootenay study area. This Appendix is, in fact, the legend which accompanies each of the twenty-two 1:50 000 mapsheets completed for outdoor recreation features. Copies of the original maps are available from the Map Library, Assessment and Planning Division, Ministry of Environment, Parliament Buildings, Victoria, B.C., V8W 1X4.

A portion of a 1:50 000 scale recreation features map is reproduced in Figure 3 in order to illustrate the type of information which is available. It should be interpreted with reference to Appendix B.

The following describes the steps taken in order to complete the outdoor recreation features mapping for the East Kootenay region:

1. The first step toward updating the Canada Land Inventory recreation capability information for the region (see Chapter One, Study Background), was an interview programme (Duncan and Duncan, 1975). The objective of this programme was to document, in both map and report form, local information relating to specific features of the region. East Kootenay residents, government and industry employees, and hunting guides were selected for interviews. The results of this study are on file in the Map Library, Assessment and Planning Division.
2. The second step entailed delineating recreation feature units on 1:70 000 scale aerial photographs. These units consist of features (e.g., a sandy-textured beach), or features patterns (e.g., a small lake with a complex of marsh and backshore vegetation, which has wildlife viewing potential) which are identified by symbols (Appendix B). Each unit may contain up to three different features. These units were designated on aerial photographs by observation of significant features and landform boundaries.

   Each map unit feature was rated for its significance based largely on comparison with other similar features in the region and/or province. Map symbols are used to express feature significance (e.g., moderate or regional feature significance is represented by a +).

   All land areas were mapped regardless of ownership or existing land status. Factors such as access, land tenure and land status did not affect the way a map unit was described. However, major, long-term transformation of the landscape, such as logging, burning or urbanization was identified, within a unit, by a circled number (annotation) subscripted to the symbol designation of that particular unit. These annotation numbers were also applied to units to indicate that additional information of recreational interest was noted (see Figure 3 and Appendix B for examples).

   Mapping for this project was carried out by initially identifying units characterized by water bodies, since these are not only prime recreation sites but also form useful boundaries between other feature units. The units adjacent to and having influence on water bodies were then classified, based on whatever significant features were present.

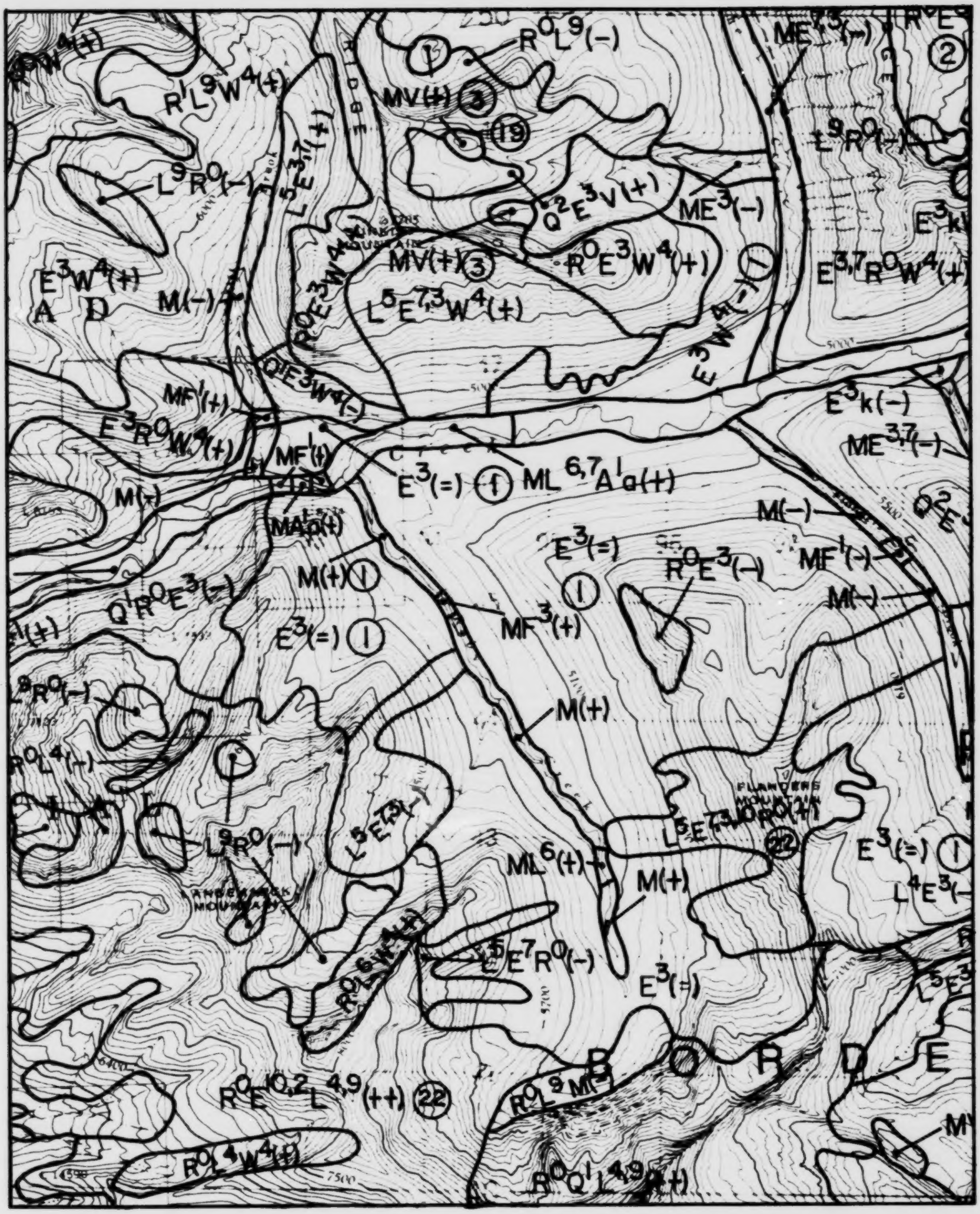


Figure 3: Example of a 1:50 000 Outdoor Recreation Features Map (portion of 82G/1)

Following this, units more distant from the water bodies were characterized as to their specific recreation features. In this manner, an entire mapsheet was divided into recreation feature units.

3. The next step, accomplished during the summer field seasons of 1976 and 1977 involved ground-checking, by vehicle and helicopter, the recreation feature units previously delineated on the aerial photographs. Information provided for units which were not ground-checked because of time or inaccessibility constraints, was derived strictly from aerial photograph interpretation and interview information. Figure 4 illustrates access routes as an indication of mapping reliability.
4. Finally, the recreation feature units, together with information gathered from field-checking, interview material, and information of recreational interest taken from other resource inventory programmes (e.g., vegetation and/or wildlife), were then transferred to 1:50 000 scale topographic base maps.

2.3 PHYSICAL CARRYING CAPACITY FOR OUTDOOR RECREATION

The physical carrying capacity assessment involves an overall interpretation of soil, terrain, vegetation, wildlife, aquatics and climate. The Terrestrial Studies Branch (formerly Resource Analysis Branch) method for evaluating physical carrying capacity is described in the aforementioned Recreation Capability Inventory (Block and Hignett, 1976).

Two small areas in the East Kootenay area were, in previous studies, assessed in this manner. These are: 1) the Springbrook project area (Resource Analysis Branch, 1975), and 2) the Windermere-Invermere Settlement Suitability project area (Terrestrial Studies Branch, in progress). Maps for these are available from the Map Library, Assessment and Planning Division, Ministry of Environment, Parliament Buildings, Victoria, B.C., V8W 1X4.

While a full carrying capacity evaluation was not carried out in the East Kootenay region because of time constraints, an attempt was made to provide some outdoor recreation capability information by utilizing soils map. Ratings for outdoor recreation carrying capacity were determined for all soil associations* mapped in the East Kootenay region (see Appendix C). Reference to a particular area of interest on a soil map will enable report users to determine which soil associations are present there. Appendix C can then be used to determine carrying capacity for outdoor recreation based on these soil associations.

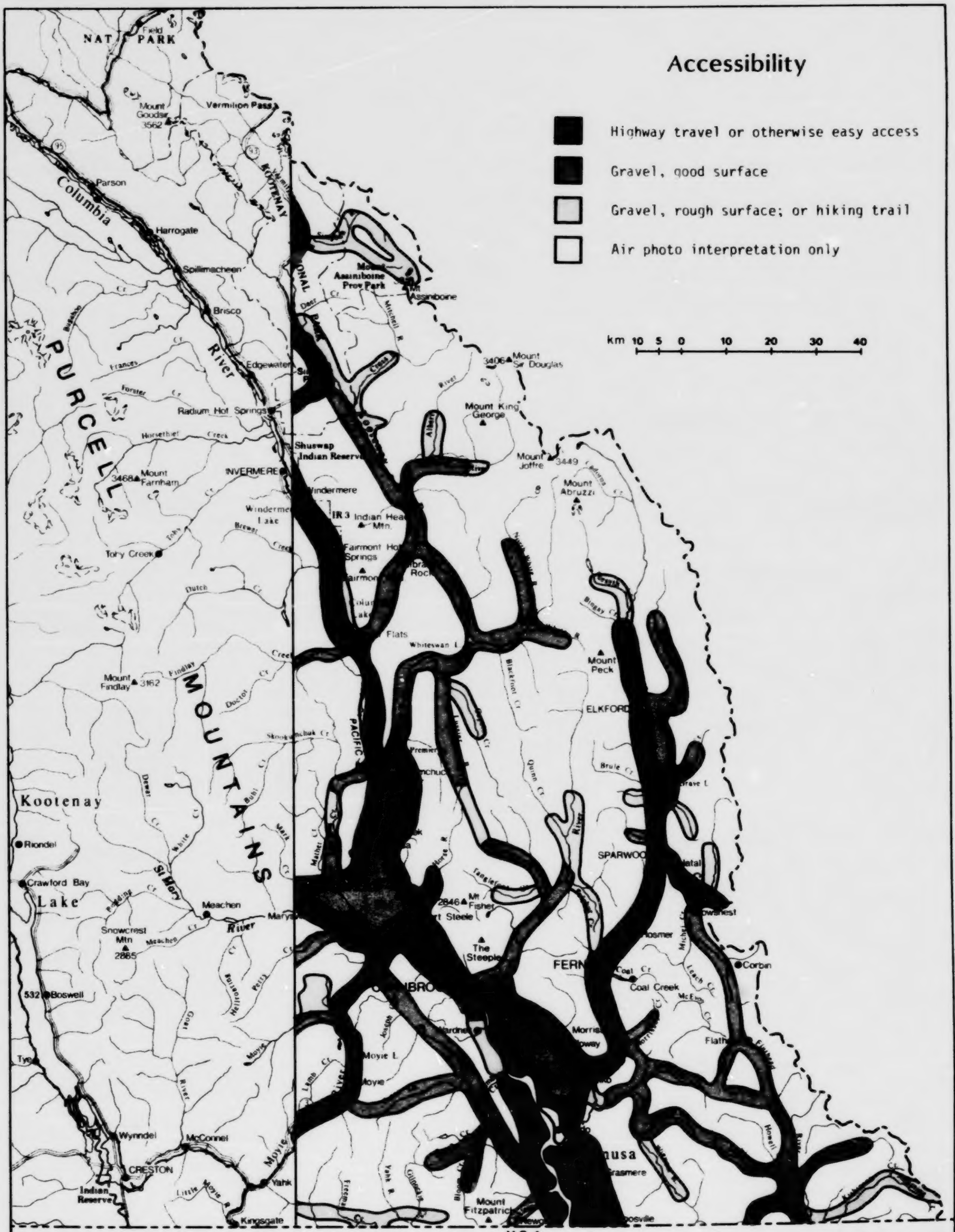

Accessibility
Highway travel or otherwise easy access
Gravel, good surface
Gravel, rough surface; or hiking trail
Air photo interpretation only
km 10 5 0 10 20 30 40
NAT PARK
Field
Vermilion Pass
Mount Goodsir 3562
Parson
Columbia
Harrogate
Spillimacheen
Brisco
PURCELL
MOUNTAINS
River
Edgewater
Radium Hot Springs
Shuswap Indian Reserve
INVERMERE
Mount Farnham 3468
Windermere
Windermere Lake
Toby Creek
Mount Assiniboine Prov Park
Mt. Assiniboine
Mount Sir Douglas 3406
Mount King George
Mount Joffre 3449
Mount Abruzzi
IR 3 Indian Head Mtn.
Fairmont Hot Springs
Mount Peck
ELKFORD
Mount Findlay 3162
Kootenay
Riondel
Crawford Bay
Lake
Meachen
St Mary
River
Snowcrest Mtn 2865
SPARWOOD
Mt Fisher 2846
The Steeple
FERNIE
Coal Creek
Corbin
Morrissey
Boswell
Wynndel
McConnel
CRESTON
Indian Reserve
Yahk
Kingsgate
Moyie L.
Moyie
Grasmere
Mount Fitzpatrick
U.S.A.

Figure 4: Map Showing Access Routes to Give Indication of Mapping Reliability

Soil associations are composed of various components of related soils which are indicated on the soil maps. For example, a soil association characterized by coarse-textured material on steep slopes (colluvium)* may have both shallow and deep components. The differences in components of a soil association may be significant enough to constitute a change in the carrying capacity rating. Report users familiar with the use of soil maps can modify the carrying capacity ratings by referring to the Recreation Capability Inventory manual (Block and Hignett, 1976, pp. 29-31).

Chapter Three

Chapter Three

OUTDOOR RECREATION FEATURE DESCRIPTIONS FOR THE TEN SUBREGIONS WITHIN THE PROJECT AREA

For descriptive purposes the study area was divided into ten subregions according to approximate watershed* boundaries. These generalized subregions, as shown on Figure 5, are as follows:

3.1 LOWER KOOTENAY RIVER
3.2 MID-KOOTENAY RIVER - PREMIER LAKE
3.3 COLUMBIA-WINDERMERE LAKES
3.4 UPPER KOOTENAY RIVER
3.5 PALLISER-WHITE RIVER DRAINAGES
3.6 BULL RIVER DRAINAGE
3.7 LOWER ELK RIVER
3.8 UPPER ELK RIVER
3.9 FLATHEAD RIVER DRAINAGE
3.10 MOYIE LAKE - YAHK RIVER

Each of these subregions is described with regard to the type and location of the most significant recreation features that it contains. Information from the outdoor recreation features maps, field notes, interviews, historical documents, past studies, and other disciplines was utilized in describing these subregions.

These descriptions are intended as a summary of the extensive amount of data presented on the 1:50 000 scale mapsheets. For detailed analysis and site-specific evaluation, the maps should be referred to with this text being used as a supplementary source of information. Figure 5 illustrates the 1:50 000 mapsheet boundaries relative to each of the ten subregions.

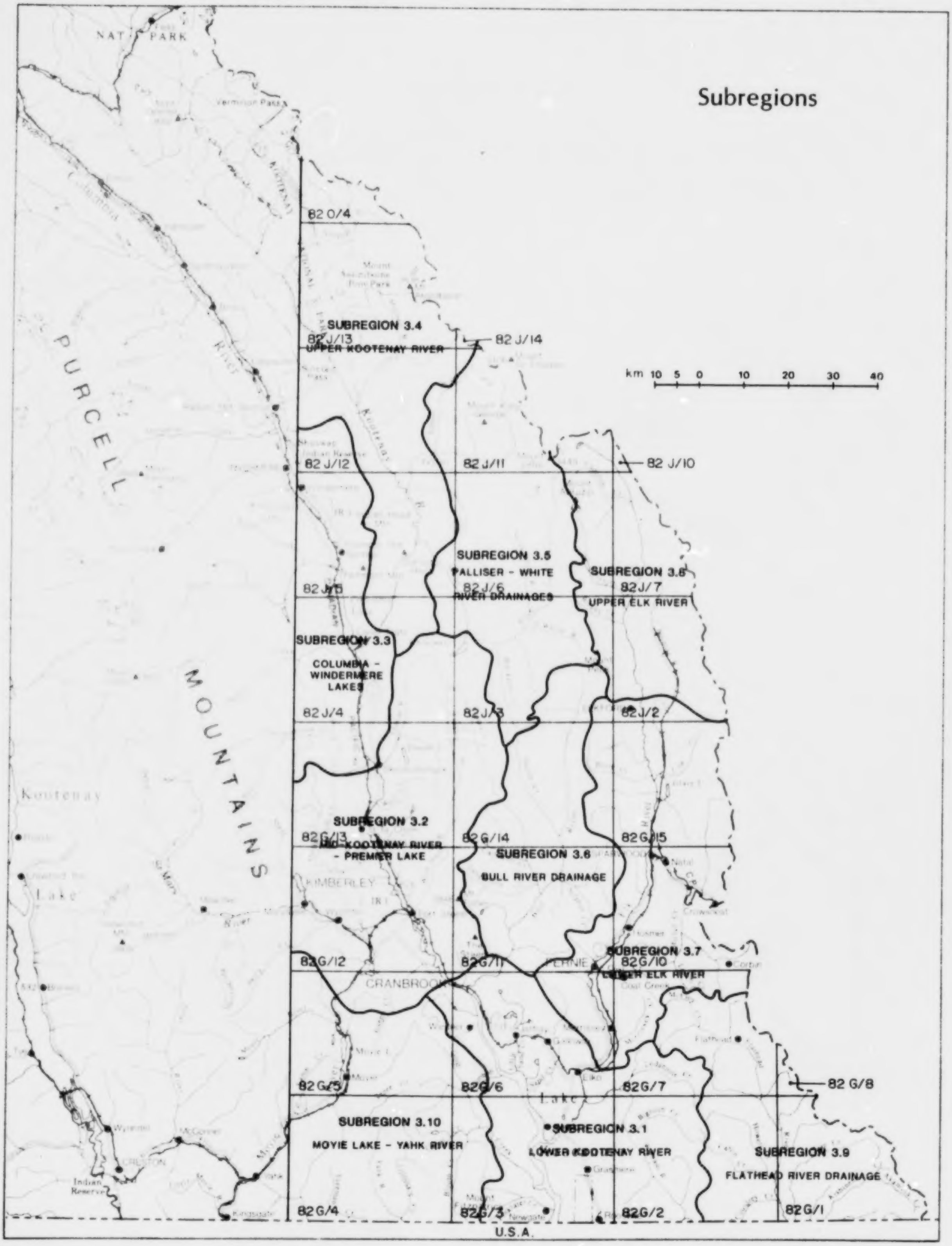

Subregions
km 10 5 0 10 20 30 40
NAT. PARK
Vermilion Pass
PURCELL
MOUNTAINS
Kootenay
Lake
82 O/4
Mount Assiniboine Prov. Park
SUBREGION 3.4
UPPER KOOTENAY RIVER
82 J/13
82 J/14
82 J/12
82 J/11
82 J/10
SUBREGION 3.5
PALLISER - WHITE RIVER DRAINAGES
SUBREGION 3.8
UPPER ELK RIVER
82 J/5
82 J/6
82 J/7
SUBREGION 3.3
COLUMBIA - WINDERMERE LAKES
82 J/4
82 J/3
82 J/2
SUBREGION 3.2
MID-KOOTENAY RIVER - PREMIER LAKE
82 G/13
82 G/14
82 G/15
SUBREGION 3.6
BULL RIVER DRAINAGE
KIMBERLEY
SPARWOOD
Natal
Crowsnest
82 G/12
82 G/11
FERNIE
SUBREGION 3.7
82 G/10
LOWER ELK RIVER
Corbin
CRANBROOK
Coal Creek
Flathead
82 G/5
82 G/6
82 G/7
82 G/8
Moyie
Elko
SUBREGION 3.10
MOYIE LAKE - YAHK RIVER
SUBREGION 3.1
LOWER KOOTENAY RIVER
SUBREGION 3.9
FLATHEAD RIVER DRAINAGE
Wynndel
CRESTON
Indian Reserve
Yahk
Kingsgate
Grasmere
82 G/4
82 G/3
82 G/2
82 G/1
U.S.A.

Figure 5: Outdoor Recreation Subregions within Project Area with 1:50 000 NTS Grid System Indicated

3.1 LOWER KOOTENAY RIVER

This subregion consists primarily of the most southerly portion of the Trench in British Columbia including the Libby Reservoir (subsequently referred to as Lake Koocanusa), and extends from the Canada-U.S.A. border to the Bull-Kootenay River confluence. It also includes the Wigwam River and its tributaries, and Lodgepole and Bighorn Creeks to the east. Areas of high recreational value are found in this unit because of the attractiveness of the Trench floor. These include several small lakes and Lake Koocanusa itself, which provide opportunities for boating, angling and swimming. Wildlife viewing and hunting opportunities are particularly good in this area.

The broad floor of the Trench is particularly significant here since it offers good opportunities for viewing the rugged peaks of the Rockies to the east, contrasted with the more gently rising Purcell Ranges to the west.

From Tobacco Plains northward to the Elk River, the topography is characterized by low, rounded hills (drumlin)*. The vegetation cover is of either variable open grasslands or forest- parkland which lends itself to viewing, hiking, horseback riding, and cross-country winter sport activities.

Plate 3.1.1 Tobacco Plains looking south toward the United States

This type of landscape is complemented by pastoral areas of farms and ranchland throughout the floor of the Trench. Typical views include: Lake Koocanusa, small agricultural holdings, large alluvial fans* from such tributaries as Elk River and Gold Creek, and the peaks of the Rockies which form a backdrop to the east.

Highly significant winter ranges*, which afford excellent opportunities for both consumptive and non-consumptive wildlife-related activities, are located in this subregion. The whole of the Trench floor is high value winter range.

Plate 3.1.2 Bull River below Aberfeldie dam: high value ungulate winter range

This subregion is significant for its bird and small mammal populations because a number of small lakes and associated wetlands* are found here. Generally, all small ponds up to 1050-1200 metres (3500-4000 feet) are potential habitats. Lake Koocanusa (Libby Reservoir) lies in an attractive setting but is limited in its usefulness for water-related activities because the water level is drawn down considerably during the summer season. The reservoir presently has good opportunities for angling, particularly for cutthroat trout. The attractiveness of its shorelines for campsites, swimming and boat launching is also severely limited due to the large fluctuations in water level, and in some areas failing banks present a potential hazard to use. Woodlands and meadows in the Trench, both east and west of the reservoir, are heavily utilized range for both wild and domestic ungulates*.

Plate 3.1.3 Lake Koocanusa: east side looking south (note cattle grazing on the shoreland)

At present, one camping area, Kikomun Creek Provincial Park, has been developed on the east shore of Lake Koocanusa south of Kikomun Creek. This park provides opportunities for camping and picnicking, and for swimming at Surveyors Lakes. A boat launch is also located at Kikomun Park.

Plate 3.1.4 Lake Koocanusa showing a portion of Kikomun Provincial Park campground

Creeks such as Gold, Linklater, Kikomun, Big Sand and Little Sand offer good recreational sport fishing opportunities. Species in these creeks include cutthroat trout, eastern brook trout, and Dolly Varden char. Angling opportunities also occur at the lower Elk and Bull Rivers and many of the small lakes in the Trench area. There is a fish hatchery on the Bull River near Wardner, which is operated by the Fish and Wildlife Branch, and is open to the public.

Plate 3.1.5 Gold Creek fan where it enters Lake Koocanusa

As mentioned above, this subregion contains several attractive small lakes. Of these, the most heavily used are Rosen and Tie Lakes and their shorelands, which afford swimming opportunities, small beaches, boating, cottaging, picnicking and camping. Smaller lakes such as North Star, Suzanne, Edwards, Loon and Wapiti offer recreational opportunities as well but generally to a lesser extent than Rosen or Tie. All are located in visually attractive settings, some have camping or picnicking facilities and most have associated wetland vegetation with potential for nature interpretation. The isolated Silver Springs Lakes located southeast of Elko, which are accessible only by hiking, are of particular interest for their attractive setting and aquamarine water colouration.

Most of the other small lakes in this subregion are generally unsuitable for swimming because of their fine-textured bottom sediments, aquatic vegetation, leeches, and pollution from cattle. However, they do add variety to the landscape.

Plate 3.1.6 Aerial view of Tie Lake

Interesting landform features, both man-made and natural, are found in many parts of this subregion. These include a dam, a reservoir and a waterfall at Bull River, and a dam in the Elk River Canyon near Elko.

Plate 3.1.7 Wigwam Flats above the Elk River canyon near Elko

The Elk River flows through a deeply-incised canyon southeast of Elko. Wigwam Flats, an elevated fan southeast of Elko, is of interest not only with regard to its viewing, grassland vegetation and wildlife habitat but also to its history of early settlement in the area.

Mount Broadwood, part of the Lizard Range, is made up of folded limestone* and presents spectacular views, particularly from the southeast. Silver Springs Lakes are situated in a canyon which was originally carved by the Elk River in Pleistocene* glacial times and has since been abandoned by the river.

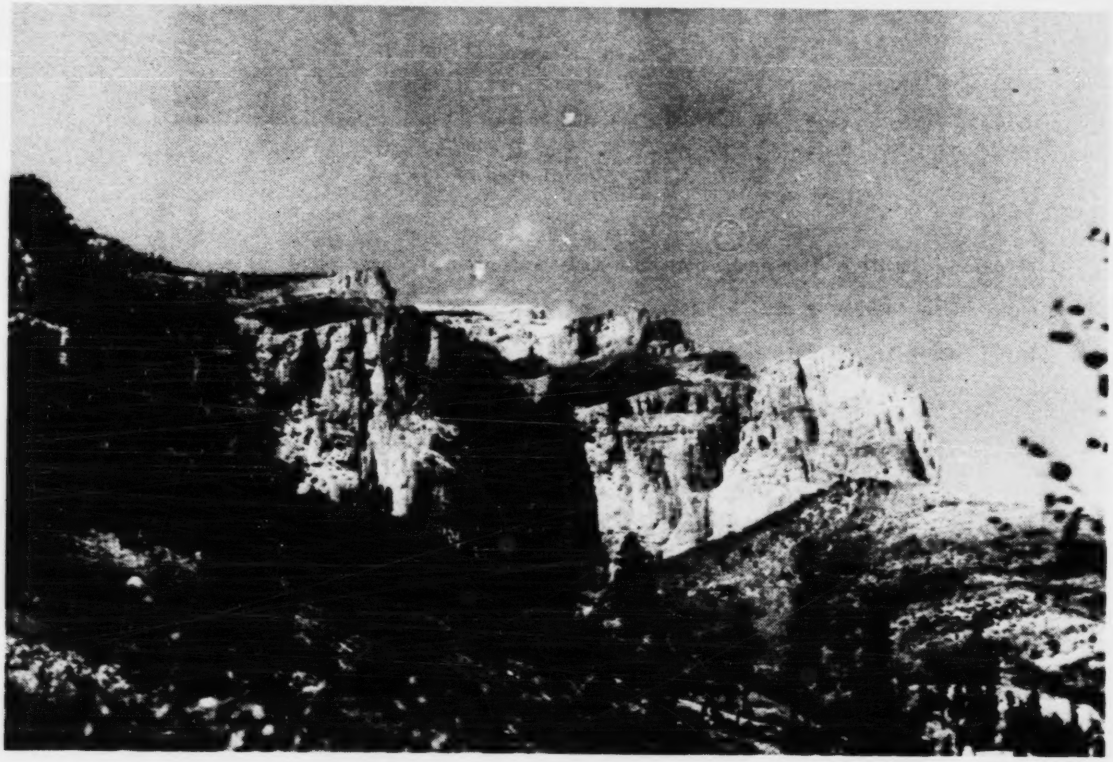


Plate 3.1.8 View of Mount Broadwood

The lower Kootenay River subregion is rich in archaeology and cultural history*. Of particular interest in this respect are: the China Wall pictographs* at Mount Broadwood depicting bighorn sheep; and a significant prehistoric* route used by native Indians which led from Kootenay River through the Wigwam River, Lodgepole Creek and North Kootenay Pass to Alberta, to their buffalo hunting grounds (Duncan and Duncan, 1975).

There is much of historical interest relating to early settlement in this area. Large mineral and timber resources were opened up in the Southeast Kootenay area in 1898 when the Canadian Pacific Railway built its British Columbia Southern branch line through the Crowsnest Pass to Kootenay Lake. The area was made more accessible in 1901 when the Great Northern Railway's main line in Montana was extended up the Kootenay and Elk River Valleys to Fernie. Considerable growth in both the coal mining and lumbering industries took place during the first few years of this century. Sawmills were located at various places along the railway lines and small settlements such as Waldo, Baynes Lake, Elko, Jaffray and Krag were established. Waldo was also on the route of the old Kallispell Trail, that was used during the Gold Rush of the 1860's to get from Montana to Wild Horse River.

During the 1860's also, fruit farming promotions brought up to 500 newcomers a month to the Baynes Lake area. The Wigwam Flats area was developed for orchard farming during this time and remnants of this activity can still be seen. A decline in the lumbering industry in this area occurred in the 1920's while at the same time mining was brought to a virtual standstill by a declining market for metals. Today these little towns have become mainly pleasant, small farming centers or rural residential areas for workers employed at the lumber mills around Elko (Affleck, 1976).

Plate 3.1.9 Old barn at Hahas Lake near Wardner - a typical pastoral scene in the East Kootenay region

3.2 MID-KOOTENAY RIVER-- PREMIER LAKE

This subregion includes the Trench from the Bull River to Skookumchuck, the Cranbrook-Kimberley area, and portions of the Hughes and Van Nostrand Ranges of the Rockies.

An abundance of outstanding recreation features is found within this area, some of which are common to adjacent subregions. One of the most significant viewing features is the Kootenay River which drains south into Lake Koocanusa. Views of the Rocky Mountain peaks are exceptional from the Trench particularly from the highway corridor. Rivers and creeks such as the Lussier, Wild Horse, St. Mary and Wolf, drain into the Kootenay River in this portion of the Trench, and several potentially significant parks and well-known East Kootenay lakes are also located here. Other recreational features of high significance include Mount Fisher and the Steeples, Top of the World and Whiteswan Lake Parks, the historic town of Fort Steele and the city of Kimberley which is modelled after Bavarian-Swiss subalpine communities.

A significant portion of the East Kootenay population resides in this area either in the major service centre of Cranbrook or in the mining city of Kimberley. Major industries include Sullivan mine, Skookumchuck pulp mill and regional service facilities in Cranbrook. This area is particularly rich in cultural history pertaining to early mining, the gold rush, railroad construction and ranching.

In the Trench itself, views of the Rockies and Purcell Mountains are excellent from along the highways. Viewing of the Trench is also possible from mountain roads leading to the abandoned Estella Mine and Mount Baker (the road to Mount Baker has recently been closed to vehicles but it is a pleasant and short hike to the top), or from hiking trails such as those leading to Mount Fisher and The Steeples. Viewing opportunities are numerous in this area as it contains a variety of diverse landscapes. Some of the high value viewing areas include St. Mary's Prairie, Premier Ridge, Mount Fisher, the Steeples, Lussier Canyon and Top of the World Park.

Plate 3.2.1 A view of Steeples Range of the Rockies and a farm along the Bull River road

Plate 3.2.2 View of wetlands to the southeast from Premier Ridge

Angling opportunities are also numerous in this subregion. In particular, Whiteswan Lake has a high fish population of rainbow trout. Mather and Wolf Creeks have high fish populations of eastern brook trout. As well, a number of small lakes such as Lazy, Twin (locally called Yankee), and

Quartz (locally call Rockbluff), are stocked with rainbow trout by the Fish and Wildlife Branch. Between Whiteswan and Alces Lakes, a rainbow trout spawning channel managed by the Fish and Wildlife Branch affords seasonal opportunities for observing fish in their natural habitat. The natural recruitment from the spawning channel to Whiteswan Lake contributes significantly to recreational fishing enjoyed by both locals and tourists.

Plate 3.2.3 Rockbluff Lake viewed from small camping area on the north shore (note weedy shoreline)

The larger lakes in this subregion, such as Whiteswan, Premier, and Wasa (also known as Hanson) have facilities for boat-launching, canoeing and angling and for camping and picnicking on their shorelands. The Whiteswan-Alces Lakes area, reached via a logging road which in part follows the Lussier River Canyon, attracts fishermen and campers from many parts of British Columbia and Alberta. Developed camping areas, maintained by the British Columbia Forest Service, are located at Whiteswan Lake and at the west end of Alces Lake. Angling at Alces Lake is limited to fly-fishing. Swimming is possible but limited by cold water temperatures and lack of sandy beaches. There is a Class "A" Provincial Park (established in 1978) surrounding the lakes which also includes Lussier Hot Springs.

Premier Lake, northeast of Skookumchuck, is also of high recreational significance and attracts tourists from the prairie provinces as well as from British Columbia. This lake and the surrounding area have provincial park status with possibilities for swimming, camping, hiking, boating, angling and viewing.

Plate 3.2.4 Premier Lake from west side: example of deep water swimming opportunities from rocky bluffs

Plate 3.2.5 Peckhams Lake: part of Norbury Lake Provincial Park

Smaller lakes in this subregion, such as Hahas and Ta Ta, are primarily of local significance in terms of their size and attractiveness. Jim Smith and Norbury Lakes are provincial parks with possibilities for picnicking, viewing, camping, canoeing and swimming.

There are highly significant wetland areas in this subregion which provide good sites for nature interpretation. Of particular interest are Wolf Creek, Bummer's Flats, and Elizabeth Lake. Saugum Creek, Reed Lakes north of Ta Ta Creek, and the Waterfowl Oxbows at the confluence of Mayook Creek and the Kootenay River. These are waterfowl enhancement project areas under the management of Ducks Unlimited, and in some cases jointly with the Fish and Wildlife Branch. Appendix G gives locations and descriptions of Ducks Unlimited project areas in the East Kootenay region. The Wasa sloughs along Highway 93 are also of particular interest with respect to waterfowl viewing. The old Kimberley Airport is a sharptailed grouse reserve established by the Fish and Wildlfe Branch.

Plate 3.2.6 Bummer's Flats waterfowl enhancement project area near Wasa Lake

Two relatively undeveloped hot springs of significance are Lussier Hot Springs in the Lussier River canyon, and Ram Creek Hot Springs which has been designated as an Ecological Reserve. Appendix E describes the Ecological Reserves which are located in the East Kootenay region.

Plate 3.2.7 Sharptailed grouse reserve at the old Kimberley Airport

Mount Fisher, which is part of the Hughes Range in the Rockies, is the most prominant peak in this subregion. Excellent trails for hiking and viewing are found here, along the Steeples which are also in the Hughes Range, and lead to the Bull River.

Hiking, viewing and wilderness camping can be experienced at Top of the World, a limited access, mountaintop provincial park. This park also features interesting alpine vegetation and karst* topography, including sinkholes*.

Other distinctive landforms of this subregion are the hoodoo* formations along the St. Mary River near Wycliffe Regional Park. The park itself, located at the confluence of St. Mary River and Perry Creek, offers views of hoodoos as well as opportunities for angling, camping, picnicking and hiking.

Wildlife values are generally very high for elk and white-tailed deer winter range everywhere in the Trench. Very high value areas for wildlife winter range include: Premier Ridge, Estella Mountain, Eager Hills and Wycliffe Prairie.

Plate 3.2.8 Wycliffe Prairie looking south toward Cranbrook: example of very high value ungulate winter range

Mines are of cultural significance in this area, particularly The Sullivan Lead-Zinc Mine in Kimberley which is one of the world's largest underground mines. An underground public tour is available here. Ruins of old mines are located at high elevations in this subregion, and include Estella and Kootenay Queen mines in the Hughes Range of the Rockies.

Another important cultural feature is the city of Kimberley which has adopted a Bavarian or alpine theme, has decorated buildings accordingly and promotes recreational activities related to this theme.

Prehistory of this subregion includes archaeological features such as prehistoric campsites and trails. At Whiteswan Lake a prehistoric trail, a quarry* and some pictographs may be found on the north side of the lake (Duncan and Duncan, 1975).

Some of the more significant features related to early European settlment of this area include the following:

1. The gold rush of 1864 was responsible for the first permanent white settlers coming to the southeast Kootenay area. The town of Fisherville, originally built on the lower benches of Wild Horse River, was burned down in order to get the gold from the townsite and later

rebuilt on the upper benches. A few old cabins and a cemetery still remain (Duncan and Duncan, 1975).

2. The city of Fort Steele, first established as Galbraith's Ferry on Kootenay River in 1864, was for many years the district's seat of government. Hotels and business houses were erected and prospectors set up tents on the outskirts of town and along the banks of the river. When Cranbrook was established as a result of the railway bypassing Fort Steele, the historic town gradually became a ghost town (Kay and MacDonald, 1972). However, Fort Steele has been restored and now stands as an important monument of the frontier days of this area.

Plate 3.2.9 Ft. Steele - showing old log buildings that were moved to this site from Fisherville

Plate 3.2.10 Gateway to the historic town of Ft. Steele with a view of Mt. Fisher in the right background

3. St. Eugene's Mission in the St. Mary River Valley was established by Father Fouquet in 18 to educate the local Indians. In 1887 Father Fouquet was replaced by Father Coccola w subsequently built a church and enlarged the Mission (Kay and MacDonald, 1972).

Plate 3.2.11 St. Mary Church near St. Eugene Mission in the St. Mary River Valley

4. The idea of blazing the Dewdney Trail, to connect the coast cities with the vast riches o the Wild Horse placer* mines, was first conceived in 1860. In 1865 trail blazing began an it took seven months to construct the 466 km mule road (Kay and MacDonald, 1972).
5. The McGinty Trail was built in 1895 from the North Star Mine at Kimberley to North Sta Landing on the Kootenay River where ore was then shipped by steamboat to Jennings, Montan (Duncan and Duncan, 1975).
6. The city of Cranbrook, originally a Kootenay Indian village, began in 1897 with th construction of the Cranbrook Hotel and a few shacks to house Canadian Pacific Railwa construction workers. The hotel stood alone on the open prairie until 1898 when activit began in anticipation of the coming railway (Kay and MacDonald, 1972). Cooking ovens built by Canadian Pacific Railway when track was being laid can still be seen in Isadore Canyon.
7. Perry Creek - at the "Old Town" townsite, there are remnants of buildings constructed during the 1867 gold discovery in this area (Duncan and Duncan, 1975).

The above describes only briefly the history of this area. Much more has been written and can be found in works by historians and local residents of the East Kootenay region (see References).

3.3 COLUMBIA - WINDERMERE LAKES

This subregion includes the Kootenay River from Skookumchuck to Mount Grainger and extends north approximately as far as Shuswap Creek. The major area of recreational interest in this subregion is the Columbia-Windermere Lake system with its aquamarine-coloured lakes, attractive wetlands and spectacular mountain backdrops. The Kootenay River is characterized by its blue-green colour, banks with deciduous vegetation, braided channels* and numerous small gravel bar islands. The recreational quality of the river deteriorates somewhat downstream from Skookumchuck as a result of pollution by pulpmill effluent. Skookumchuck, Findlay, Dutch, Shuswap, and Windermere are the most significant creeks in this area.

A wide variety of possible recreational activities within this subregion make it one of the most important in the East Kootenay area. Significant opportunities exist for hiking, cross-country skiing, hunting, snowmobiling, nature interpretation, camping, viewing and water-oriented activities.

Columbia and Windermere Lakes are of exceptional scenic value. Angling, boating, water-skiing and limited swimming are the most common activities associated with both lakes. Mountain whitefish, burbot and Dolly Varden char inhabit both lakes.

Swimming opportunities are restricted mainly to resort areas and public beaches, most of which have been improved by sand and gravel fill. Although these shorelines are characterized by fine-textured bottom material and aquatic vegetation, a number of small, sandy-gravel point bars* are suitable for swimming. Athalmer Beach which is located at the north end of Windermere Lake is now a Class "A" Provincial Park with day use facilities under construction.

A number of boat launching facilities are available on both Columbia and Windermere Lakes. A Canadian Pacific Railway track runs adjacent to the shoreline on the west side of the lakes and limits, to some extent, the quality of recreational opportunities available along these shorelines.

Plate 3.3.1 Columbia Lake: view to northeast from south end of the lake

Plate 3.3.2 Windermere Lake looking south from east side of the lake near Pantycelon Beach Resort area

The Columbia River marshes* have an extremely high recreational value. A canoe trip through this area in summer offers excellent opportunities for nature interpretation, viewing, and photography. Osprey and bald eagles are common species observed in this marsh system, together with other large birds such as Canada geese and blue herons. Due to the late spring flooding the river bottom is suited best for early nesting species such as Canada geese. Other waterfowl, although not present in large numbers in the nesting season, congregate in large numbers after the breeding season until freeze-up forces them to find open water further south. Smaller birds present include kingfisher, rails, bitterns, yellowhead and redwinged blackbirds, and sandpipers. A variety of duck species also occupy the area during the summer months. The marshes are inhabited by large numbers of beaver and muskrat. Signs of their presence such as dam and lodge construction, runs and tunnels, are evident throughout the area.

Plate 3.3.3 Marshy area at the south end of Columbia Lake viewing Fairmont Mtn. to the east

Armstrong Bay, on the east side of Columbia Lake, is a significant area for nature interpretation since it supports a variety of upland and wetland wildlife species.

Extensive areas of ungulate winter range are located within this subregion. Very high value winter ranges include the benchlands between Findlay and Dutch Creeks, and the east side of Columbia Lake. The rest of the valley bottoms consist of high capability winter range.

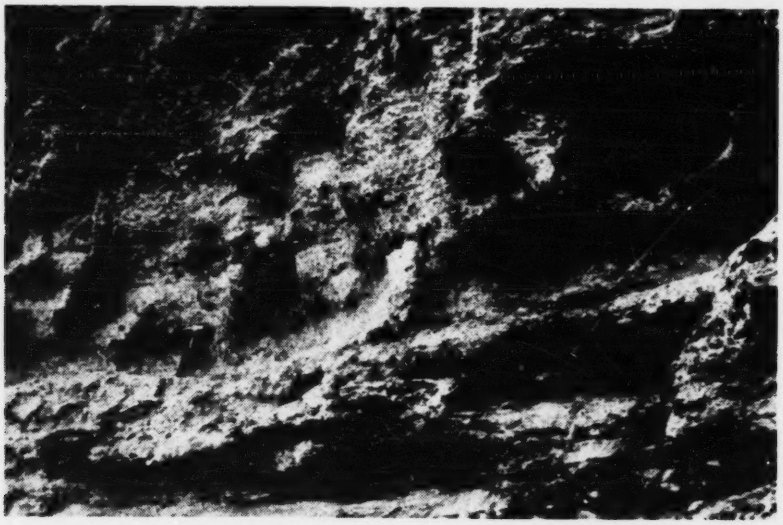


Plate 3.3.4 Example of ungulate "mineral licks" near Copper Creek north of Skookumchuck

Mineral-rich streams drain into Columbia Lake from the southeast shoreline approximately two kilometers north of Canal Flats. These streams coat the rock face of the shoreline with mineral deposits. The upland meadow areas associated with these streams have been collectively designated as an Ecological Reserve.

Fairmont Hot Springs is a well-established, nationally significant resort area which offers developed facilities for camping, hotel accommodation, hot spring bathing, golfing and downhill as well as cross-country skiing. This is a major tourist attraction that draws users from many parts of Canada, Europe and the United States.

Several small lakes and wetland areas of recreational interest are located in this subregion.

Johnson Lake located on the west side of Highway 93, approximately 13 km south of Canal Flats, offers camping, picnicking and angling opportunities, and there is a small beach and boat launching ramp at the south end of the lake. Several wetland areas of significant scenic value are located between Johnson Lake and Canal Flats. Tamarack Lake located north of Skookumchuck Creek, provides excellent wildlife observation and birdwatching opportunities. The group of lakes south of Lavington Creek, including Copper Lake, is noted for cutthroat trout angling potential. A small hiking trail connects the lakes with the main road which is reached via Findlay Creek.

Plate 3.3.5 Tamarack Lake near Skookumchuck

The wetland north of Marion Creek on the west side of Columbia Lake, provides habitat for beaver and is another significant birdwatching area. A higher elevation wetland area, which is designated as an Ecological Reserve, is located on the northwest slopes of Mount Sabine.

The Dutch Creek hoodoos are a landform of high significance which add viewing interest to the Highway 93 corridor. Sport fish species found in Dutch Creek include burbot, Dolly Varden char and mountain whitefish.

Plate 3.3.6 The Dutch Creek Hoodoos

One of the main attractions of Findlay Creek is an impressive bedrock canyon that extends approximately eight kilometres downstream from Deer Creek. Natural caves can be seen in some sections of the canyon wall. Sport fish species found in Findlay Creek include cutthroat trout, Dolly Varden char and mountain whitefish. The adjacent upland is characterized by forest parkland vegetation which provides camping and viewing opportunities. Dry, "salt flat" grasslands are an unusual vegetation feature found on the north side of the creek, west of the Deer Creek confluence.

A canyon and waterfall with pools suitable for bathing are significant features of Skookumchuck Creek, located approximately four kilometres west of the pulp mill. An unusual log cabin, with a two-story hexagonal tower, is located on an attractive abandoned homestead site adjacent to the canyon.

A deep sinkhole lake and environs which is located east of the North Windermere Creek confluence is associated with a high bedrock escarpment* and a wetland area. This area offers camping, picnicking and hiking opportunities.

Subalpine areas offering excellent hiking opportunities can be found on Fairmont Ridge, Indian Head Mountain and at Pedley Pass. Fossils*, mostly of shellfish types, can be found in the Pedley Pass area and on the ridges at the head of Windermere Creek.

This subregion appears to have been the major focus of prehistoric activity. The remnants of Indian pit-houses* can been seen on the east side of both Columbia and Windermere Lakes. Pictographs are located in the Armstrong Bay area, on the southeast side of Columbia Lake north of Canal Flats, and in the Findlay Creek area.

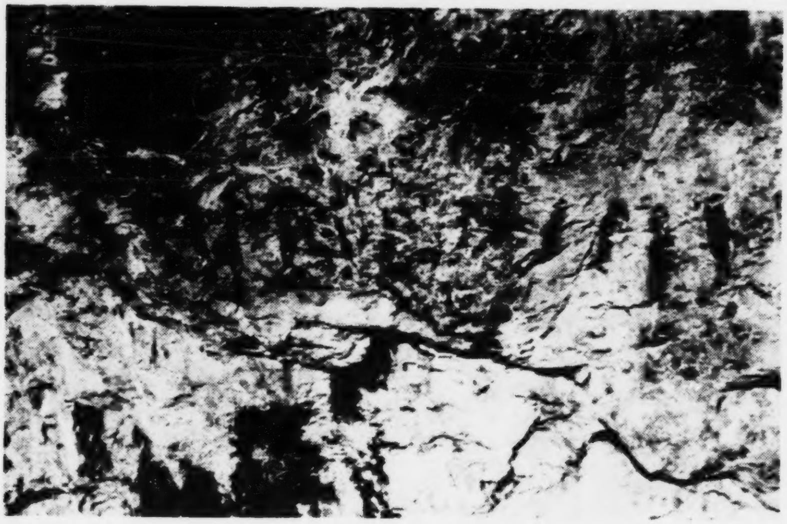


Plate 3.3.7 Prehistoric pictograph located on east side of Columbia Lake

David Thompson, representing the North West (Fur) Company, was the first white man to journey through the East Kootenay region. In 1807, he and his small party established a fort and trading post near the mouth of Toby Creek and called it "Kootenay House" (also spelled Kootenae). Other travellers through this area were George Simpson and party in 1841; Father De Smet, an early missionary to the Indians, in 1845; and other fur brigade men. Baptiste Morigeau was probably the first white man to build his home in the area, just north of Lake Windermere. James Sinclair made two trips in 1841 and 1854, with the Red River settlers for the Hudson Bay Company. Sinclair Canyon and Creek were named after him (Kay and MacDonald, 1972). In the years 1858-59 John Palliser and his party, which consisted of a geologist, a meteorologist, a botanist, and a secretary, explored and studied the area. Palliser had been commissioned by the British government to find out whether one or more practical passes suitable for a wagon road or a railroad existed over the Rocky Mountains within British Territory (Smyth, 1977).

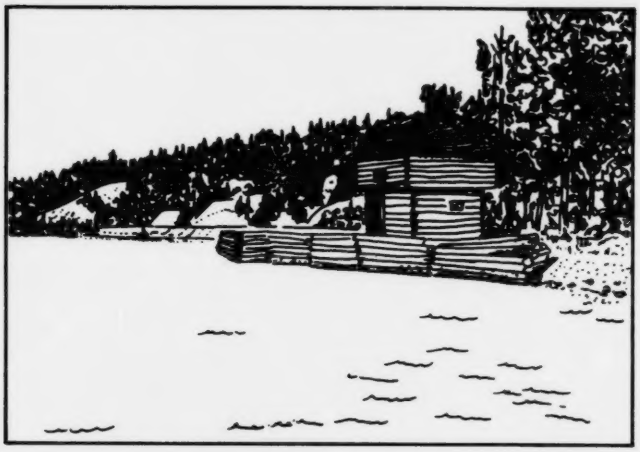


Figure 6: Sketch of blockhouse from David Thompson's fort

Remnants of the Baillie-Grohman Canal, built in 1887 to connect Columbia Lake with the Kootenay River, can still be seen in the wetland area west of Canal Flats. The Thunderhill Mine, which operated in the 1850's, was one of the first mine sites in the East Kootenay region. It was located on the southwest side of Columbia Lake, where remnants of an old tram track which led up to the mine can still be seen.

Windermere is the site of "The Stolen Church" which was actually taken from the town of Donald and brought by wagon and barge to Windermere in 1897. Attractive farmland areas in the Windermere vicinity add significant viewing interest to the present day landscape.

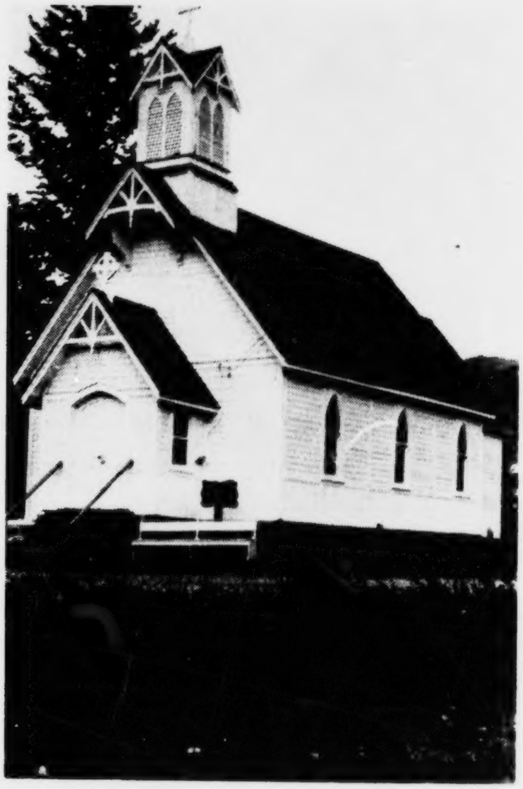


Plate 3.3.8 Church at Windermere known as "the Stolen Church" which was originally located at Donald, B.C.

3.4 UPPER KOOTENAY RIVER

This subregion is dominated by recreational features associated with the major river corridors of the Kootenay, Cross and Simpson and with the subalpine and alpine environments of the Continental Divide as well as the other ranges. It is an area of exceptional scenic quality. Kootenay National Park and Mount Assiniboine Provincial Park are located within the boundaries of this unit. Recreational activities are mainly oriented toward mountaineering and corridor travel.

The Kootenay River Valley is the major corridor in this subregion. In the soutnern section the Kootenay floodplain consists of a wide, braided channel and numerous gravel bars. The river is substantially smaller in the northern section where the Vermilion River is the major watercourse. The Kootenay Valley provides excellent opportunities for viewing, camping, hiking and cross-country skiing. Sport fish species in the Kootenay River include cutthroat trout, Dolly Varden char, and mountain whitefish.

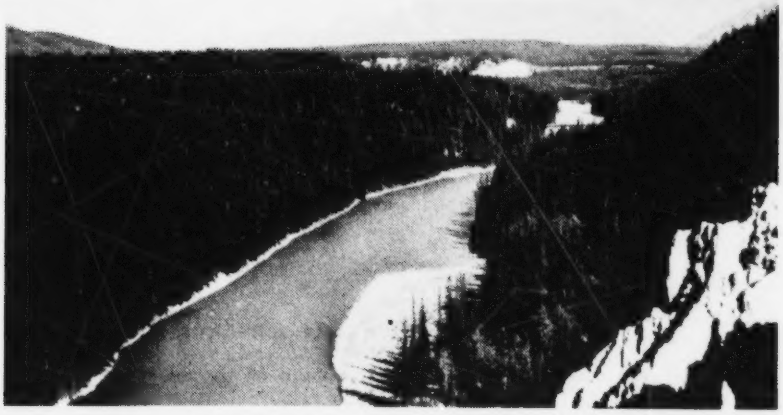


Plate 3.4.1 A section of the Kootenay River north of Gibraltar Rock (note hoodoos in right front corner of photograph)

From McLeod Meadows to Canal Flats, the Kootenay is an excellent wild river providing challenging opportunities for white-water kayaking, canoeing and rafting. Commercially guided raft trips take place here. This section of the river was, in the summer of 1977, assessed by a Parks Canada study of navigable mountain rivers. It was rated as one of the finest quality river travel corridors in the western Provinces. The symbology used on the 1:50 000 Outdoor Recreation Features maps for the Kootenay River in this section (mapsheets 82J/4,5 and 12) reflects the information gathered during this assessment. The Kootenay River Valley is also a significant viewing corridor which has undergone only slight disturbance as a result of logging and road construction. Other features of recreational interest which can be found on this route include high terrace walls of calcium carbonate cemented sands and gravels, waterfalls from tributary creeks, remains of old settlement areas, mineral streams and pitted limestone rock formations such as Gibraltar Rock. Detailed information, in map and report form, on this section of the river is available from the Parks Canada office in Calgary, Alberta (Hooper, 1978).

Hector Gorge on the Vermilion River is a narrow canyon of easily erodible, white phyllite* rock. The colour contrast of the water and canyon is an interesting viewing feature. Kootenay, White, Cross, and Palliser Rivers also flow across similar phyllite formations.

Dolly Varden Creek is a small tributary of the Kootenay River south of Kootenay Crossing. It is a particularly attractive area that has been developed by Parks Canada for hiking, cross-country skiing and "walk-in" camping.

The Simpson River and Surprise Creek are followed by wilderness trails into Mount Assiniboine Provincial Park, a limited access park. Features of recreational interest include the campsite area at the Simpson-Surprise Creek confluence, Police Meadows on the Upper Simpson and Rock Lake on upper Surprise Creek. The Simpson River offers angling opportunities for cutthroat trout and Dolly Varden char.

The Cross River is a major drainage of the East Kootenay region. Logging roads provide vehicle access to much of the valley. The wide, braided* floodplain of the Cross River provides viewing and camping opportunities. Two waterfalls of high significance are found on the lower section of the river. Both falls can be seen from associated short hiking trails. Sport fish species of the Cross River include cutthroat trout, Dolly Varden char and mountain whitefish.

Plate 3.4.2 View of Mt. Assiniboine with Magog Lake in foreground

Plate 3.4.3 Cross River box canyon falls carved into the bedrock

The Mitchell River Valley is followed by a trail into Mount Assiniboine Provincial Park. The present road system extends to the Aurora Creek confluence. The wide floodplain of the Mitchell, downstream from Aurora Creek, provides significant opportunities for viewing and camping. Cutthroat trout and Dolly Varden char are the sport fish species associated with the Mitchell.

The lower Palliser River flows through a canyon approximately 1.5 km in length. An interesting section of this canyon can be viewed from the abandoned bridge site south of Little Elk Creek.

This subregion includes relatively extensive alpine and subalpine areas of national and provincial significance. Many subalpine lakes of superb scenic quality occur here including Sunburst and Magog Lakes, the Rock Isle Lake complex, Eohippus and Talc Lakes. These lakes and also Simpson, Marcel, Wonder, Citadel and Whiteswan Passes, are of exceptional recreational quality and are well used, particularly in conjunction with access from Banff National Park.

Plate 3.4.4 View of the Citadel Pass area showing alpine - subalpine landscape

Plate 3.4.5 The Sunshine area near the B.C.-Alberta border offers good opportunities for wilderness hiking and camping

Smaller subalpine areas of lesser significance include Kindersley Pass area north of Sinclair Creek, Gibraltar lookout area on the east side of the Kootenay River south of Mary Anne Creek, and the Mount Soderholm area. These areas are excellent for weekend hiking.

This subregion has high wildlife values. Winter ranges are found in the valleys of the Kootenay, Cross and Simpson Rivers. Areas of high significance for wildlife include: the Mitchell Range, the Stanford Range, and Simpson Range.

Several small lakes and wetland areas are present in the Kootenay River Valley. Short hiking trails have been established by Parks Canada to Cobb and Dog Lakes. An attractive wetland area known locally as Warden's Lake is located north of Dog Lake. The Salt Lake Meadows area, north of the confluence of the Palliser with the Kootenay River, is a wetland complex of regional significance that provides opportunities for scenic viewing and wildlife observation. The east side of Kootenay River within the National Park boundaries is closed to vehicular traffic, and is an excellent day-use area for hiking, bicycling, and cross-country skiing. Fenwick Lake, northeast of the Palliser-Kootenay River confluence, offers significant angling and camping opportunities. Olive Lake and Kootenay Pond adjacent to Highway 93 add viewing interest to the vehicle route. A group of old cabins is situated at Yearling Creek beside a meadow which has camping and viewing potential.

Plate 3.4.6 Salt Lake Meadows wetland complex

Historically this subregion was the site of early exploration along the Continental Divide. George Simpson, in 1841, was the first white man to cross the Rockies by way of Simpson Pass. In 1845 Father De Smet, a missionary, travelled through Whiteman Pass into the Cross River drainage.

3.5 PALLISER - WHITE RIVER DRAINAGES

This subregion consists of the drainage basins of the Palliser, White and Albert Rivers. It is fairly inaccessible area in the centre of the Park Ranges of the Rockies. In general, the area is characterized by broad, U-shaped glacial valleys carved into soft phyllite bedrock. The Royal Group of mountains in the Palliser drainage is the most visually outstanding feature of this subregion.

This area is relatively isolated because access is limited to logging roads. Vistas of high mountain peaks are common from roads in the main valleys. Especially attractive viewscapes are those of the Royal Group of mountains and the mountains at the headwaters of the North White River. Major valleys are characterized by steep, rocky side-walls and views of rugged mountain peaks.

Unfortunately the forests in many of these valleys have been extensively damaged by Mountain Pine beetle infestation, and resultant salvage logging of dead and dying trees decreases the visual attractiveness of the area. Most of the major valleys are partially logged.

Plate 3.5.1 Albert River (tributary of the Palliser River) with a view toward Mt. Soderholm

The lower valley sides are densely forested where not logged, while upper elevation forests are dissected by avalanche tracks and meadows. Outstanding examples of krummholz* vegetation, especially alpine larch, can be seen in the Royal Group of mountains and the mountains at the headwaters of the North White River. Partially logged old growth cedar stands in the Albert River drainage are unusual in the Rockies.

Palliser and White Rivers are characterized by aquamarine colouration which is due to their high sediment load of fine silt particles. Rivers in this subregion are generally entrenched into the soft, phyllite bedrock. They are suitable for kayaking and canoeing, and there are good camping and picnicking sites on their banks. Attractive waterfalls can be observed in the canyon of Palliser River near the confluence with Little Elk Creek.

Plate 3.5.2 White River in canyon of phyllite rock

A number of high altitude cirque* lakes are found in this subregion, however, most of them are relatively inaccessible. There are also many small lakes on the rocky topography characteristic of the high elevation area north of Russell Peak. These lakes form a visually attractive lake-krummholz meadow landscape pattern.

There is moderately good angling in the White, Albert and Palliser Rivers, primarily for cutthroat trout, mountain whitefish and Dolly Varden char. Munroe and Queen Mary Lakes are favourable for cutthroat trout fishing.

One of the most important features of this area is the large number of elk that inhabit higher elevation meadows and avalanche tracks. Mountain goats are often found on subalpine and alpine ridges and mountains. Soda Springs mineral pool on the Palliser River is an important wildlife observation site. Animals such as moose, elk, white-tailed deer and mule deer can usually be found here.

Plate 3.5.3 Soda Springs pool in the Palliser river valley

The resistant limestones that form the peaks above the main valleys are characterized by precipitous slopes and rugged, glacial sculpture. In contrast, the floors of the main valleys are broad and flat. As mentioned earlier, the hummocky* mountain top area at the headwaters of the North White River is an attractive high elevation landform feature. High elevation areas, with subdued topography such as this, are uncommon in this part of the Rockies.

Small north-facing glaciers are present on Mount King George and Russell Peak. These glaciers, combined with rocky topography, glaciated landform features, krummholz vegetation, and small lakes form a picturesque mountain setting.

Historical aspects of this subregion are derived mainly from trails and passes used by Indians. In addition, abandoned cabins can be found throughout the White River area, in particular at Jock and Jack Creeks.

3.6 BULL RIVER DRAINAGE

This subregion is characterized by the landscape patterns of the Bull River drainage contrasted with the surrounding high, rocky peaks and ridges of the Kootenay, Park and Front Ranges. Apart from logging and limited mining activity, the subregion is essentially undeveloped. Access is limited and the subregion has wilderness recreation potential in areas such as Top of the World Provincial Park. The area offers good possibilities for both viewing and hunting of wild animals. The Dibble Glacier - Hungry Peak area has potential as a downhill ski area.

Summer Lake is an attractive subalpine lake that is set in the eastern base of Ruault and Dingle Mountains. It is accessible by logging road and is joined to Top of the World Provincial Park by a foot trail. Both Summer Lake and Cliff Lake to the south are good areas for wilderness activities such as camping, hiking, canoeing and angling, mainly for cutthroat trout. Swimming is limited by cold water temperatures.

Plate 3.6.1 Summer Lake during drawdown

Summer Creek has some small but attractive cascading waterfalls at its upper end and from a road running parallel to it, avalanche track vegetation can be viewed. This creek, below Summer Lake, has many beaver dams and ponds. The wide terraces along Galbraith Creek provide pleasant sites for camping, picnicking and scenic viewing, particularly of coloured foliage in the autumn.

Plate 3.6.2 Gravelly terraces of Galbraith Creek

Plate 3.6.3 Goathaven Peak with view of the Bull River

There are some significant rock formations in this subregion, many of which can be viewed from the floodplains of Galbraith Creek and Bull River. These include panoramic views of Goat Haven and Empire State Peaks. Empire State Peak has an interesting "hole in the rock" formation which has been attributed to karst solution of limestone.

Plate 3.6.4 Interesting "hole in the rock" landform at Empire State Peak

Plate 3.6.5 Example of "kettle" formation along the Bull River

Landforms of interest include alpine karst features such as sinkholes found in Top of the World Provincial Park. An ice disintegration kettle* can be seen along the Bull River terraces between Galbraith and Sulphur Creeks and a waterfall cascades through a karst opening in a rock face along Galbraith Creek.

High value summer ranges for elk, mountain goats and Rocky Mountain bighorn sheep occur in this subregion. High value winter range for mountain goats occurs on Goat Haven Mountain, and moderate value winter ranges for elk and moose occur along the Bull River Valley bottom.

Plate 3.6.6 Outfitters' cabin located by Galbraith Creek

Angling values are moderate for Bull River and its tributaries. Sites with good camping and angling potential are found along the Bull River and Galbraith Creek. Sport fish species including Dolly Varden char and mountain whitefish are found in Bull River and cutthroat trout are found in Bull River and Galbraith, Tanglefoot, Quinn and Sulphur Creeks. Summer Lake is stocked with cutthroat trout by the Fish and Wildlife Branch.

This subregion, in general, does not hold particularly high historical significance. The archaeology of this subregion consists primarily of routes used by the Indians on their hunting trips. For example, Bull River was used for access to Alberta from Fording River Pass via Brûlé Creek. Top of the World Park contains remnants of a prehistoric chert* quarry, a hunting area, possible trading camp and a possible prehistoric hunting camp.

Plate 3.6.7 View of Galbraith Creek

3.7 LOWER ELK RIVER

The Lower Elk River subregion includes Elk River Valley from the Trench to Elkford, and adjacent mountain ranges. It also includes a large area of coal-bearing mountains east of Fernie and south of Sparwood. Its most significant recreational characteristics are scenic viewing opportunities along the Elk River floodplain and alternating forest-meadow vegetation patterns of upland areas. The subregion contains the visually significant Highway No. 3 travel corridor which parallels the Elk River as far as Sparwood and connects British Columbia with Alberta via the Crowsnest Pass. Elk Valley, Crowsnest, and Elko Parks are located on this highway corridor. Another highway, which provides good opportunities for viewing mountain peaks and wildlife, runs north up the Elk Valley.

Coal mining has played a prominent role in the history of this subregion and interesting ruins can be observed at various locations. Such recreational activities as hiking, skiing (both downhill and cross-country), hunting, fishing, camping and canoeing and kayaking may be carried out in this area.

Those features of the Elk River and its floodplain that are most significant include: (i) the river itself for canoeing and kayaking as well as angling for such sport fish as cutthroat trout, mountain whitefish, Dolly varden char and eastern brook trout; (ii) associated gravel bar beaches which may be used for camping or picnicking; and (iii) scenic views of variable open to semi-open vegetation cover and pastoral landscapes.

Below Sparwood, tributaries of Elk River which generally hold moderate recreational significance include: Hartley, Fairy, Lizard, Morrissey and Coal Creeks. In these creeks, angling potential is highest at Lizard for cutthroat and eastern brook trout, moderate at Coal for cutthroat trout and moderately low at Hartley for cutthroat trout and Dolly Varden char. The waterfalls on Fairy Creek and Lizard Creek are relatively significant because of their scenic viewing potential and their proximity to Fernie.

The Fernie Provincial Park campsite located near the waterfall at Lizard Creek provides good facilities for camping, picnicking and hiking.

Plate 3.7.1 Cokato farmland offers pastoral views to travellers along the Highway 93 corridor

Plate 3.7.2 View along the Elk River floodplain between Hosmer and Sparwood

Josephine Falls on the Fording River are situated in a bedrock canyon and flow over a fairly wide ledge. These falls reach a height of 25 metres and have associated cascades and minor falls. They are of high significance as a viewing feature in the East Kootenay region.

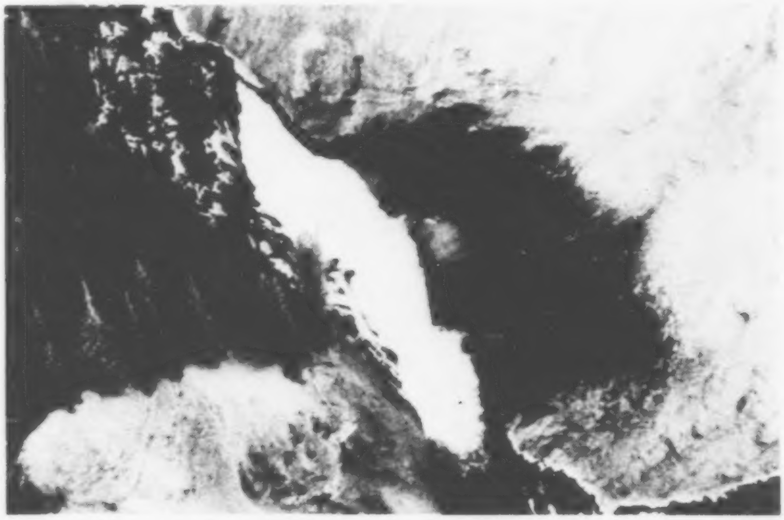


Plate 3.7.3 Josephine Falls

These creeks and adjacent areas support a wide variety of recreational activities that include hiking, camping, picnicking, scenic viewing, and angling. They also have potential for horseback riding and cross-country skiing along trails and roads adjacent to the creeks.

Tributaries of Elk River from Sparwood to Elkford which are of moderate recreational significance have the following angling values: (i) generally low for Cummings, Nordstrum, Brule and Boivin Creeks; (ii) the Grave-Harmer Creeks complex has variable areas of low, moderate and high values for cutthroat trout; (iii) Line Creek from mouth to canyon is seasonally high for Dolly Varden char and mountain whitefish, moderate above the canyon, and holds potential for observing spawning fish; (iv) Michel Creek is generally moderate with small sections rated high for cutthroat and eastern brook trout; (v) Fording River is generally moderate for Dolly Varden char below Josephine Falls, and moderate to high for cutthroat trout above the falls. In general, creeks in this subregion are characterized by steep-sided valleys.

Grave Lake is the major lake of recreational significance in this subregion. It is very important locally since it is the only lake of its size in the area. It can be utilized for family boating, swimming, camping, picnicking, scenic viewing and nature interpretation, and it is stocked with kokanee and rainbow trout by the Fish and Wildlife Branch. There are many summer cottages along the northwestern edge of the lake.

Plate 3.7.4 Grave Lake Regional Park picnicking, camping and swimming area

Two other smaller lakes in this subregion are Island Lake, located on Lizard Creek in an attractive setting and featuring an interesting abandoned log lodge; and Barnes Lake, situated in a remote area near Flathead Pass, also in an attractive setting, which has wetland meadows nearby and provides good opportunities for wilderness camping, hiking and canoeing.

The vegetation of this subregion primarily consists of coniferous tree cover. However, the wide Elk River floodplain and areas adjacent to some of the tributary creeks support extensive areas of deciduous and mixed forest types which are colourful in the autumn.

Plate 3.7.5 Barnes Lake area offers wilderness hiking and canoeing opportunities in a scenic mountain setting

Morrissey Ridge, the Lizard Range (which is accessible from the Fernie Ski Hill) and the Continental Divide all contain areas of subalpine-meadow vegetation with favourable topography for hiking and viewing. The Fernie Ski Hill is a provincially significant downhill ski area used by both locals and tourists.

Interesting rock and topographic formations are numerous throughout this subregion. Of particular significance are the western ridges of the Continental Divide. The Lizard Range, Mount Fernie, Three Sisters Mountain and Mount Hosmer contain spectacular bedrock ridges which can be viewed from Highway No. 3 near Fernie. Interesting karst landforms can be found in the Lizard

Plate 3.7.6 View of the town of Fernie from the Fernie Ski Hill

Plate 3.7.7 The Lizard Range as viewed from Island Lake

Range. A glacier of high significance is located between Mount Gydosic and Mount Washburn at the head of Cummings Creek.

Winter range values are high in the valley bottom for elk and moose, and high for Rocky Mountain bighorn sheep on the provincially unique high elevation grasslands in the northeast quarter of this subregion. A "mineral lick" and springs of very high significance are located near Fording Mountain and offer excellent opportunities for viewing wildlife.

Plate 3.7.8 Elk Valley north of Sparwood: high value ungulate winter range

This subregion, like the Mid-Kootenay River-Premier Lake (3.2) and Columbia-Windermere Lakes (3.3.) subregions, is rich in the history of early settlement. Several inventory projects have been conducted in the Elk River drainage by the British Columbia Heritage Conservation Branch. Prehistoric activities relate mainly to campsite and trail locations used by the Indian people prior to white settlement.

Crowsnest Pass, part of the main route through the area, acquired its name as a result of a band of Crow Indians, on a horse-stealing raid in the Blackfoot territory, being massacred in their camping "nest". Captain John Palliser, first white man to learn of the pass, and his party used this pass during their expeditions of 1859-1860. The pass became the divisional point during the building of the Canadian Pacific Railway's Crowsnest line in 1897 (Akrigg and Akrigg, 1973).

White settlement of this subregion developed following the discovery of rich coal beds throughout the area. Fernie (originally named Coal Creek) was named after William Fernie, the foreman on the Dewdney Trail extension to Wild Horse Creek. In 1887 he discovered coal on one of the tributaries of Michel Creek, and during further explorations disclosed vast coalfields in the Elk River Valley and adjacent areas (Akrigg and Akrigg, 1973). In 1897, the development of mines really got underway with the formation of the Crowsnest Pass Coal Company. The company owned the narrow gauge Morrissey, Fernie and Michel Railway, which ran from Fernie up to the mines at Coal Creek. Highway No. 3 from Fernie to Elko rests on the road bed of the former British Columbia Southern railway (Ramsey, 1963). The towns that sprang up and were abandoned or partially abandoned during the years that followed included Morrissey, Morrissey Mines, Coal Creek, Hosmer, Michel and Corbin.

Plate 3.7.9 Example of old coal coking ovens located at Hosmer

The towns were fraught with disasters. Mine explosions, strikes, forest fires and the depression all played a part in the history of these small, struggling communities. Yet today, this area is thriving, with Fernie as its major urban focal point and coal as its prime industry. New mines and settlements are being developed in Elk River Valley north of Sparwood.

Plate 3.7.10 Remnants of coal processing plant at Coal Creek

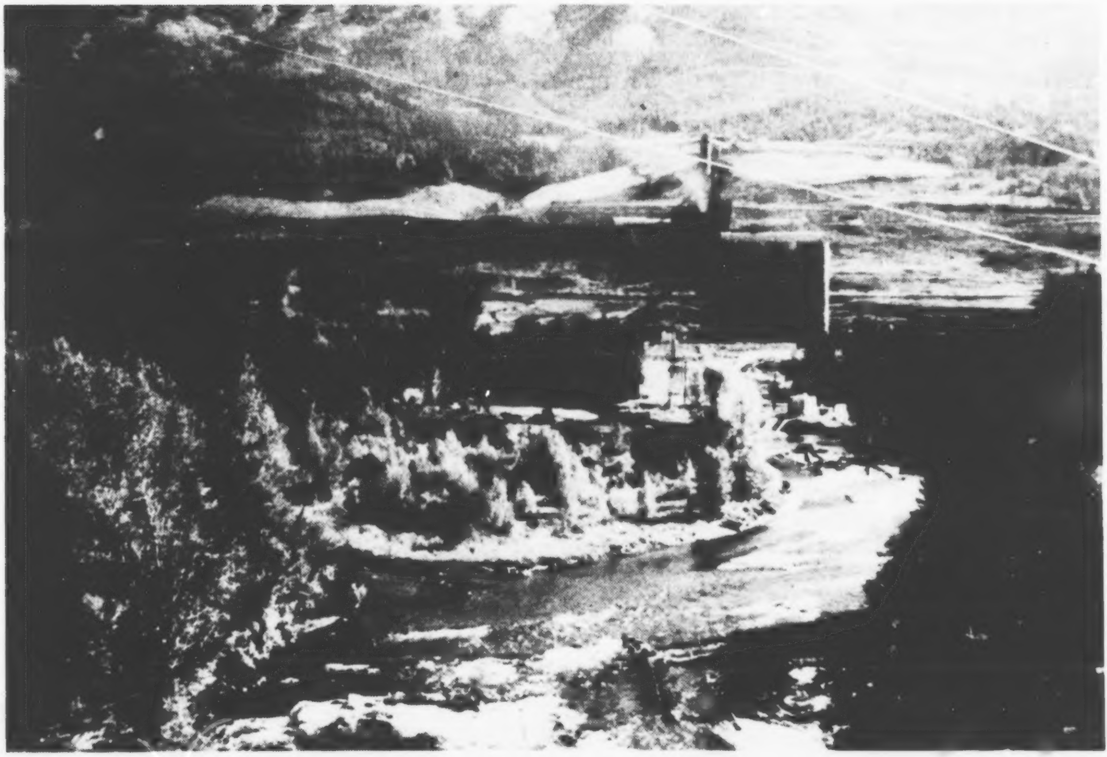
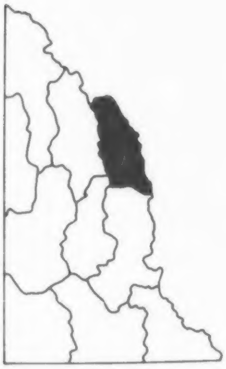


Plate 3.7.11 Present day coal processing occurring at Sparwood

3.8 UPPER ELK RIVER



This subregion encompasses the area bordered by the Continental Divide to the north and east, Connor Lakes to the west, and Crossing Creek to the south. It is very important for scenic viewing and high elevation activities such as wilderness hiking and camping. Another very important recreational activity that takes place here is hunting.

This subregion is largely undeveloped although mining activities occur at the upper end of Fording River and at Weary Ridge, and logging activities occur in many of the side valleys. It is therefore an area which is attractive to people seeking a wilderness experience for activities such as hiking or hunting.

The broad Elk River Valley becomes even wider north of the scenic limestone ridge of the Greenhills Range and spectacular views of the Elk Ranges may be gained from the gravel road corridor which parallels the river as far north as Upper Elk Lakes and the British Columbia-Alberta border. Good views can be obtained from numerous vantage points in this area due to the openness of the valley. A particularly significant viewpoint is found at the Britt Creek Forest Service lookout tower which is accessible by a rough gravel road.

The Elk River, an important viewing feature of this area, is characterized by a meandering channel*, with headwaters in the Upper Elk Lakes Provincial Park and has tributaries such as Forsyth, Quarrie and Cadorna Creeks and the Fording River. Opportunities for outdoor recreation along Elk River and its floodplain include canoeing and kayaking, picnicking, viewing, fishing and hunting, and winter sports such as snowmobiling and cross-country skiing.

Two major lake systems are found in this unit. The Elk Lakes area to the north, which is a Provincial Park, consists of Upper and Lower Elk Lakes and surrounding meadows, mountains and glaciers. The lakes are glacier fed and are set in a picturesque cirque basin. The area offers good opportunities for wilderness camping, hiking, canoeing and scenic viewing.

Connor Lakes area consists chiefly of steep topography and hummocky valley bottoms with some wetland areas of shrub willow and bog birch. Opportunities for hiking, angling and hunting in this area are excellent. Access to these lakes can be gained only by flying or hiking. A British Columbia Forest Service cabin and a primitive campsite are located in the area between the lakes.

Plate 3.8.1 View of the Elk River near Round Prairie

Plate 3.8.2 Aerial view of Connor Lakes

The drainage basins of the western tributaries of Elk River contain small but attractive lakes, and subalpine and wetland vegetation. They are suitable for limited access wilderness hunting, hiking and camping. Small cascades and waterfalls are common in this subregion. A 30 metre high waterfall is found on Pétain Creek.

Angling opportunities are numerous in this subregion. Particularly high values exist in the Elk Lakes for cutthroat trout, Dolly Varden char and mountain whitefish; in Connor Lakes for cutthroat trout, in Cadorna and Abruzzi Lakes for cutthroat trout, and in Elk and Fording Rivers for cutthroat trout, mountain whitefish and Dolly Varden char.

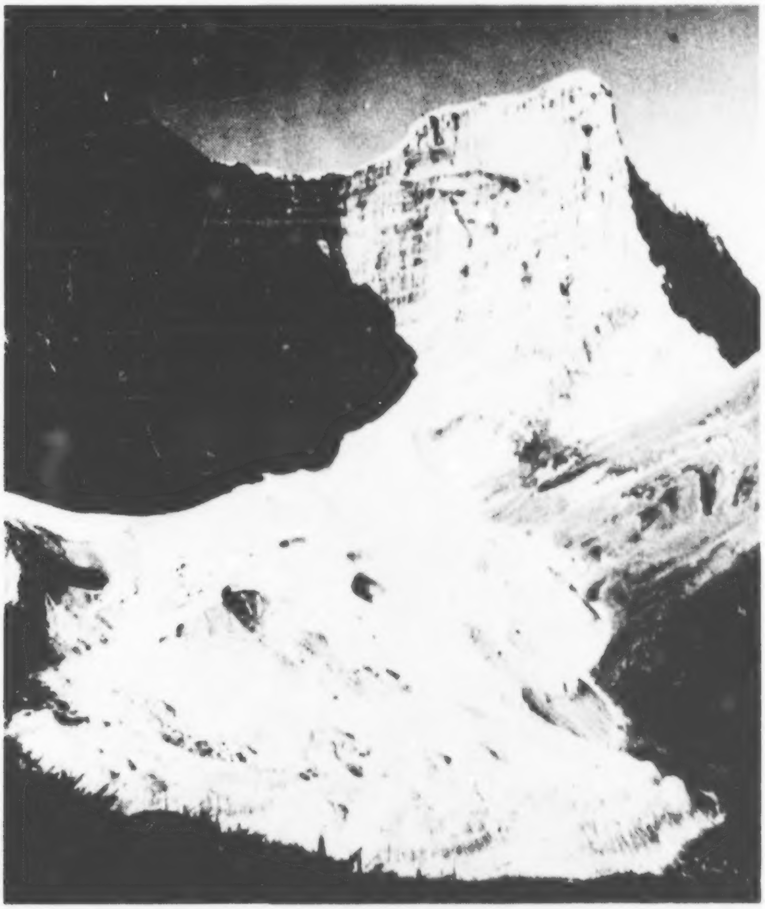


Plate 3.8.3 Rock glacier landform feature on Mt. Abruzzi

Glaciers are relatively common in this subregion. Mount Abruzzi glacier is the most extensive. The ridgetop glaciers of Elk Lakes Provincial Park form a spectacular backdrop to the lakes and meadows. Glaciers are usually surrounded by precipitous, rocky slopes and hummocky areas of glacial debris with very little vegetation due both to recent glacial recession and the severe climate associated with their high elevations.

Vegetation at high elevations is characterized by patterns of forest, avalanche tracks and meadows below steep rocky peaks. Both Elk and Fording River Valleys have extensive wetlands which provide excellent ungulate and waterfowl habitat and viewing opportunities. The attractiveness of lower elevation forests has been somewhat reduced by current mining and logging activities. Areas such as the lookout tower above Britt Creek feature attractive krummholz and alpine meadow vegetation.

Plate 3.8.4 Wetland area in the upper Elk River Valley near Elk Lakes Provincial Park

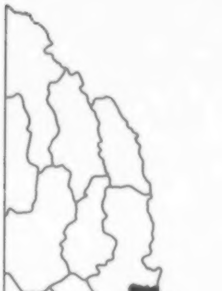
Rugged, angular, rocky peaks characterize the background views of this subregion, especially from the floor of the Elk and Fording River Valleys. Vertical rock strata form a particularly interesting skyline along the east side of the Elk Valley north of Cadorna Creek. Cirque basins, high passes and glacial moraines* are distinctive landform features. Middle slopes have large areas of talus* and avalanche tracks which, in the Upper Elk, extend to the valley floor.

Wildlife values in this subregion include: high value year round ranges for mountain goats and bighorn sheep; high value winter ranges for bighorn sheep and elk on the provincially unique high elevation grasslands in the tributaries on the east side of Fording River; and, moderate value elk and moose winter ranges in valley bottom of Elk and Fording Rivers.

Plate 3.8.5 Pastoral setting in the Elk River Valley near Elk Prairie

Of particular archaeological significance, is the Fording River Pass. This was originally a travel route from the Bull River, which was used heavily by the Indians to reach their hunting grounds east of the Rockies in Alberta. There is also a fairly well defined trail, originally used by Indians, which links Abruzzi Lake and Cadorna Lake to White River (Duncan and Duncan, 1975).

3.9 FLATHEAD RIVER DRAINAGE



This subregion consists of the upper reaches of Flathead River to the International border, the Macdonald Range to the west and the Continental Divide to the east. It is dominated by the wide floor of the Flathead River Valley. The peaks of the Continental Divide provide an outstanding backdrop to the dense forests of the Flathead Valley. The area is of high value with respect to big game hunting and fishing.

Views of the Continental Divide peaks are a major feature of this subregion. These peaks are similar in appearance to the rugged peaks of Waterton National Park in Alberta and Glacier National Park in the U.S., which are immediately adjacent to this subregion. They are characterized by outcrops of red, green and purple argillite*. The mountains in the Macdonald Range to the west are lower and relatively subdued; their summits are generally forested.

Plate 3.9.1 Summit on Montana border - North Kintla Creek

Flathead River and its adjacent terraces afford ample opportunities for camping, picnicking, angling and canoeing. The upper reaches* of the river are characterized by wetland areas with potential for viewing waterfowl and large mammals. The eastern tributary creeks of Flathead River typically flow out of steep-sided glacial troughs, while tributaries from the west have broader valleys.

Plate 3.9.2 Upper Flathead River at Crossing Creek

Creeks and rivers which provide angling potential include the Flathead River itself and Howell, Sage, Kishinena, Elder, Couldrey and Cabin Creeks. Sport fish species include cutthroat trout, Dolly Varden char and mountain whitefish. Spawning of Dolly Varden char and cutthroat trout and mountain whitefish may be observed at Howell Creek.

A few small lakes such as Procter, Beryl, Marl and Frozen occur in this area. Their shorelands provide limited camping sites. Small, high elevation lakes in the Kishinena-Akamina area include Wall and Forum Lakes which are situated in attractive cirque basin settings. These basins are suitable for recreational activities such as wilderness hiking and camping.

Wildlife values are generally high for this subregion. They include high value winter ranges for moose and elk in major valley bottoms; and moderate value year round ranges for mountain goats in the Macdonald Range including Piaysoo Ridge and on the peaks of the Clark Range. Logging and mining roads extend into major valleys allowing hunters access into higher elevation habitats.

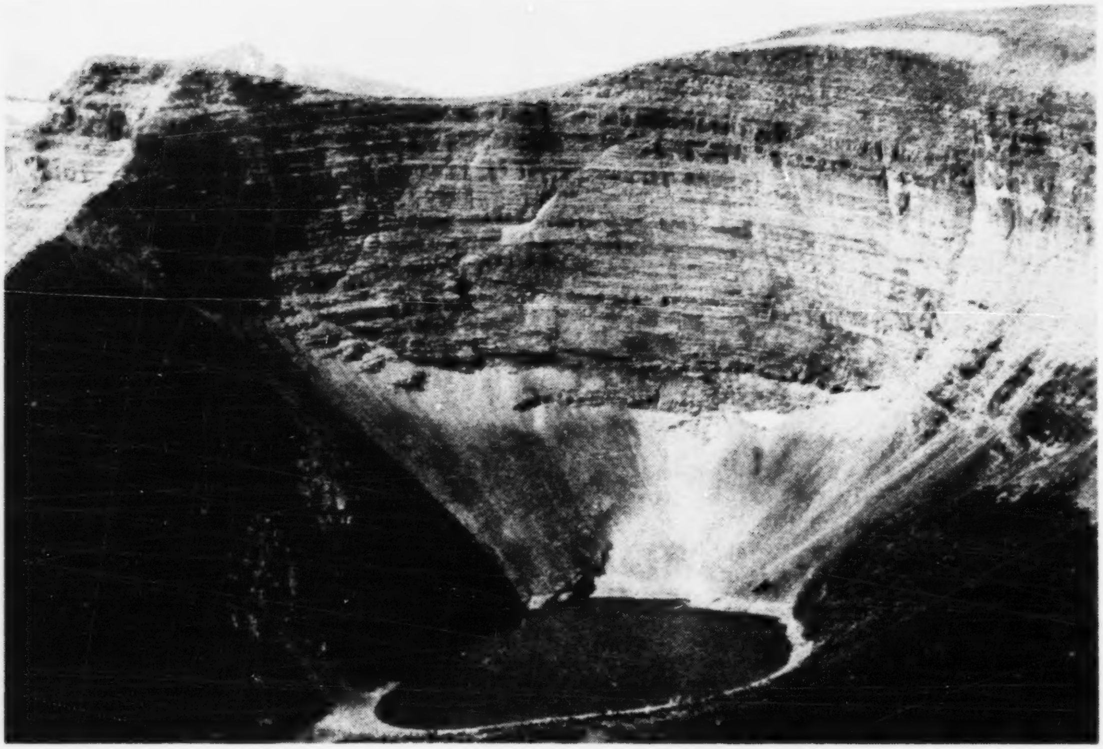


Plate 3.9.3 Forum Lake - steep walled cirque lake

Plate 3.9.4 Aerial view of the Flathead River Valley - high value ungulate winter range

As mentioned previously, the lower slopes of the Flathead Valley are densely forested, as are the mountain peaks to the west. The vegetation on the steeper peaks of the Continental Divide consists of coniferous forests dissected by avalanche tracks. Attractive krummholz meadows and forests are common in cirque basins and high valleys. The floodplain and lower terraces of the Flathead River are characterized by mixed deciduous-coniferous forest vegetation which provides interesting autumn colour contrast.

The glacially sculptured peaks of the Continental Divide feature many glacial landforms such as the cirque lakes of the Kishinena-Akamina Ridges. Lateral and terminal moraines and rubbly ground moraines are also found here. High elevation karst topography can be seen in the area of the British Columbia Forest Service lookout tower west of the Flathead border crossing; and erodible shales* can be seen in the Cabin Creek Pass area.

Plate 3.9.5 View of vegetation of Commerce Peak

Plate 3.9.6 Oil rig remnants

Of archaeological interest is the route from Kootenay, Elk and Wigwam Rivers to Lodgepole Creek and then through North Kootenay Pass to Alberta which was used by Indians to reach their buffalo hunting grounds. Of historical interest is the abandoned Flathead locality located at the confluence of Flathead River and Squaw Creek, which was, in the 1930's or 1940's, an oil drilling site. Remnants of oil wells can be seen at Burnham Creek and at Sage Creek near the Flathead River. Many attempts were made to drill a producing well in the Flathead area from the 1890's on but none of them were successful. The Flathead area has remained largely unpopulated due to its remoteness but it has a long history of hunting and guiding activities associated with it.

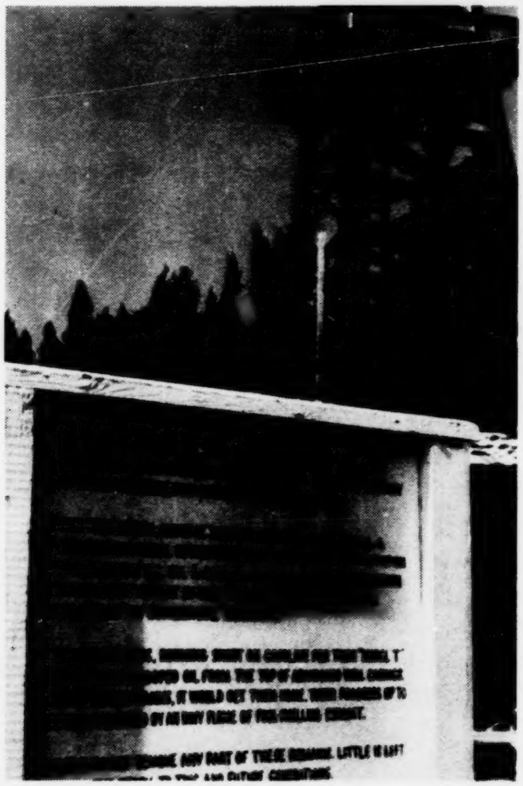


Plate 3.9.7 Oil rig signpost - explanation of "oil in Flathead"

A wilderness park was proposed by the British Columbia Parks and Outdoor Recreation Division for the Kishinena-Akamina area which abuts Waterton and Glacier National Parks but has since been rejected. Nevertheless, this particular watershed area has been assessed by the Parks and Outdoor Recreation Division and the Sierra Club as having a high potential for outdoor recreation.

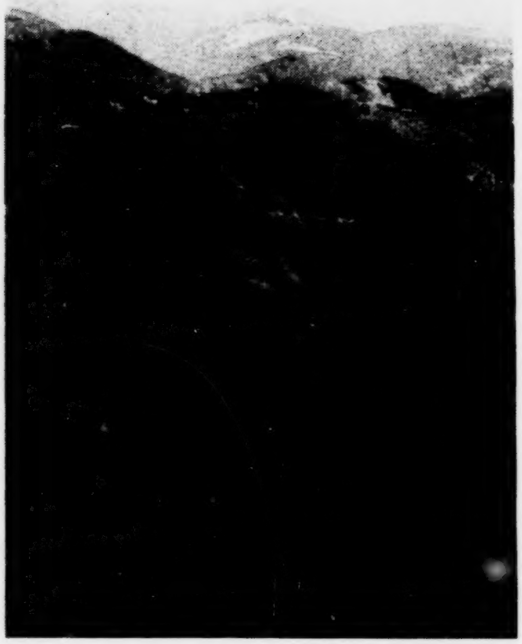


Plate 3.9.8 View of summit of Akamina Ridge

3.10 MOYIE LAKE - YAHK RIVER

This subregion includes the Purcell Mountains south of Cranbrook. Major features of recreational interest in this area are Moyie Lake and the Moyie River - Highway 3/95 corridor. There are many opportunities within this corridor for recreational activities such as angling, boating, swimming and nature interpretation. The remainder of the subregion consists of relatively low relief, thickly forested, or partly-logged mountains with limited appeal for outdoor recreation use.

Moyie Lake has been divided by fluvial fans from tributaries creeks; a narrow channel joins the two parts of the lake. The lake offers a diversity of recreational opportunities. At the north end is a Provincial Park with camping, picnicking, and boat-launching facilities, and a small, gravelly beach area for bathing. Canoeing and birdwatching potential is high in marshy areas at the north end of the lake as well as in the mid-lake channel. The shoreline of the lake is comprised chiefly of steep bedrock outcrops interspersed with dense mixed stands of coniferous-deciduous vegetation. As a result, there are only a few sandy beach areas. To a large extent, the backshore of Moyie Lake consists of privately owned summer cottages and private beaches or Highway 3/95. Kokanee and eastern brook trout offer high value fisheries in the lake. Angling is rated as moderate for sport fish species such as rainbow trout, Dolly Varden char and cutthroat trout.

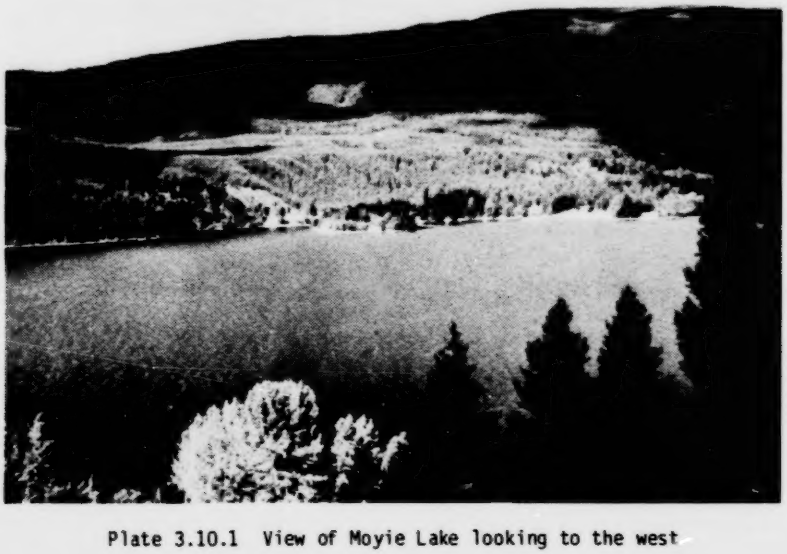


Plate 3.10.1 View of Moyie Lake looking to the west

Moyie River below Moyie Lake, and Highway 3/95 make up the main travel corridor of this subregion. The highway follows an interesting scenic route from Creston to Cranbrook. Moyie River in this section is narrow and meandering, and is good for canoeing and nature interpretation. It also offers moderate angling opportunities for the sport fish species mentioned above and for mountain whitefish.

Excellent views of the river, the lake, attractive rocky slopes and small areas of farmland can be seen from the highway. The general upland coniferous forests are not particularly visually significant but occasional stands of deciduous trees create colourful autumn landscapes. The small town of Moyie on the east side of Moyie Lake contains interesting ruins and buildings still in use which are related to its mining history.

Munroe, Palmer Bar, Negro and Cherry Lakes in the Purcell Mountains are small but have some potential for recreational activities such as canoeing and angling. Munroe Lake is stocked with cutthroat trout by the British Columbia Fish and Wildlife Branch.

Plate 3.10.2 View of Caven Creek area in the Purcell Mountains

There are a number of small creeks in this subregion which also offer some potential for angling for sport fish species such as cutthroat and rainbow trout, Dolly Varden char and mountain whitefish. The most significant of these are Gold, Caven, Bloom, Teepee, Gilnockie and Palmer Bar Creeks. Some of these also contain areas which lend themselves to day or weekend camping and picnicking use. In particular, Gold and Teepee Creeks have a number of small terraces which are already used fairly regularly by anglers and campers. Along Caven Creek there are two camping areas which are maintained by British Columbia Forest Service.

Teepee Creek road passes by an interesting exposure of varves* (thin, alternating layers of silt and clay) in glaciolacustrine* sediments.

Wildlife values for this subregion are not particularly intensive compared with areas previously discussed. Significant wildlife values include moderately high winter range values in the Moyie River Valley for elk, moose, white-tailed and mule deer; and moderate winter range values for elk and moose in Hawkins, Caven and Gold Creek Valleys. This is the only subregion of the project area that has woodland caribou. A few scattered herds occur in the upper Moyie River-Lamb Creek watersheds.

Plate 3.10.3 Moyie microwave tower area - hiking and subalpine vegetation viewing opportunities exist here

Yahk Mountain and the Moyie lookout tower are suitable areas for hiking and viewing of subalpine vegetation along ridgetops and summits. A cedar-hemlock forest can be found to the west of Moyie Lake.

The cultural heritage aspects of this subregion are significant in terms of early settlement of the East Kootenay region. Of particular interest is the old Dewdney Trail route which followed the Highway 3/95 corridor westwards as far as Moyie Lake, continued along the east side of the lake, then crossed over at the north end of the lake to follow Peavine Creek to Cranbrook, and finally ended up at Wild Horse. The East Kootenay Historical Society has since restored part of the trail.

What is now the quiet little town of Moyie was, between 1898 and 1911 a bustling mining and lumbering community. The St. Eugene mine at Moyie produced over 60 percent of the lead mined in Canada in 1907 and ranked as the largest silver-lead mine in Canada. Extensive lumbering was also carried on around Moyie (Smyth, 1977). St. Eugene mine, part of an old hotel and other structural remnants can still be seen in the area, giving evidence of old Moyie and its early industrial boom.

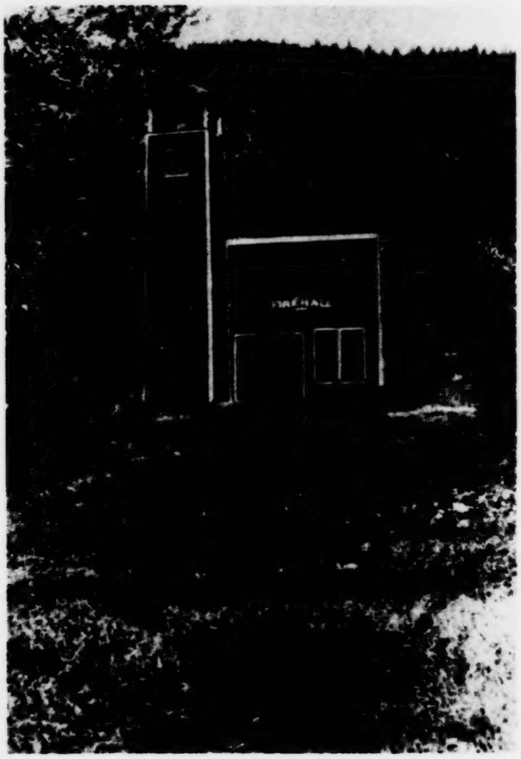


Plate 3.10.4 Historic firehall at town of Moyie

Lumberton, now a "ghost town", is located near Highway 3/95 at the north end of this subregion. It began in 1903 as a lumber mill town called Wattsburg and thrived as such until 1938 by which time most of the accessible timber had been logged. Remnants of large old buildings at Lumberton can still be seen today (Smyth, 1977).

Plate 3.10.5 Building remnants at "ghost town" of Lumberton

Chapter Four

Chapter Four

DISCUSSION AND RECOMMENDATIONS

4.1 DISCUSSION OF SIGNIFICANT OUTDOOR RECREATION FEATURES

The previous chapters outlined the purpose of this report and its accompanying outdoor recreation feature maps, described the methods used to this end, and highlighted the most significant recreation features found in the project area. This chapter discusses the inter-relationship of outdoor recreation areas and regional land uses.

The recreational resource values of the East Kootenay region are of very high provincial significance. The parklands and lake systems of the Trench, the forested uplands and the subalpine and alpine areas provide an exceptional variety of recreational features and allow a range of associated activities. Recreational users of the region come from many parts of Canada, the United States and Europe.

In recent years a tremendous increase in outdoor recreation, combined with continued resource development in this area has given rise to conflicting opinions regarding the best use of East Kootenay resources. Extensive logging and mineral exploration have opened up many previously inaccessible areas to a wide variety of recreational users. However, this has not always been to the satisfaction of the conservationist since increasing accessibility is commonly followed by landscape degradation, reduction of animal populations, and loss of wilderness areas. As well, controversy has arisen where potential developments have high value recreational features. Several potentially valuable recreational areas and features are discussed below.

4.1.1 LAKE KOOCANUSA (THE LIBBY RESERVOIR)

Lake Koocanusa and its surrounding area (see subregion 3.1) have the potential for greater outdoor recreational use. The main limiting factor at present is that continuous full pool (738 metres or 2459 feet) levels of the lake have never been reached during the primary use months from June to September (Tisdale, 1977). In its present state, it is only minimally useful for limited camping and angling activities. However, with appropriate management, the area could become a valuable location for a moderate range of outdoor recreational activities. Its proximity to Tie and Rosen Lakes, the urban amenities offered at nearby Fernie, the historic and pastoral aspects offered by Baynes Lake, Newgate and Wardner and the upland hiking potential of the Wigwam Flats and Mount Broadwood area add recreational interest to this area.

4.1.2 COLUMBIA-WINDERMERE LAKES AREA

The Columbia-Windermere lakes and Columbia River marshes are recreation feature areas of very high significance (see subregion 3.3). They are located along one of the major viewing corridors of the province and, as such, are enjoyed by a large number of people. Maintenance of the inherent natural quality of this natural system is of prime importance. This is a major factor that should be weighed against plans for large scale resort or urban development, or access development, or for the proposed diversion of the Kootenay River.

4.1.3 RECREATIONAL RIVERS

The Kootenay River, between Vermilion Crossing and Canal Flats (discussed under subregion 3.4), is a navigable waterway of high significance. While it presently offers a recreational opportunity limited to only a small number of people, it is important to maintain the inherently high quality recreational values of this river corridor.

This is the only stretch of river in the East Kootenay region which has been thoroughly evaluated for its recreational potential. However, if studies were done on other rivers in the region, for example the Elk, Bull or White Rivers, similar potential might be noted, not only for white water boating specialists, but also for families seeking milder forms of river recreational activity. Certain rivers could then be set aside for recreational purposes, and on others mitigation* of disturbance from logging, mining or other development activities could be incorporated into regional plans.

4.1.4 WILDERNESS RECREATION AREAS

Three areas which offer particularly high value wilderness recreational opportunities are the Palliser-White River area, the Upper Elk River tributaries and the Kishinena-Akamina ridge areas.

These have been previously discussed under subregion 3.5 - Palliser-White River Drainages, subregion 3.8 - Upper Elk River and subregion 3.9 - Flathead River Drainage, respectively.

These areas offer exceptional wilderness hiking, camping, trail riding and scenic viewing opportunities. Conflicts frequently arise over the question of whether or not they can be maintained as exclusively "wilderness" recreation areas. Given existing economics and use statistics in British Columbia, it seems both unrealistic and idealistic to attempt to retain as much of the landscape as possible for strictly "wilderness" recreational use. While it is important to protect certain exceptional wilderness areas, such as those mentioned above, it is also necessary to create a land-use base which fulfills the needs of a variety of users. Some would argue that logging and mining activities in fact create recreational access for those who would otherwise not be able to get into certain areas. Others argue that, given access, these areas will then be over-used by recreationists. The information which is provided by APD Biophysical Resources of the East Kootenay Area Bulletins should be of assistance to planners in achieving an appropriate balance of recreational and industrial use in the region. Provision of adequate opportunities for wilderness recreation experiences must be considered and planned for, prior to development of an area, by regional and provincial management planners.

4.1.5 ARCHAEOLOGICAL AND HISTORICAL FEATURES

Historical and archaeological features are highly significant in the East Kootenay region. Indian pictographs*, petroglyphs* and other landmarks of pre-white settlement are of major importance with regard to the cultural history of the region and are of interest to tourists. They need to be recognized and preserved.

The various subregions discussed in Chapter Three include areas of high significance with regard to pioneer settlement of the East Kootenay region. Fort Steele and the Wild Horse River area of Fisherville (subregion 3.2) attest to early gold rush days of the region. Many smaller-scale historic sites are also found in the area. Remnants of the gold rush, mining and logging, trapping and guiding activities are evident throughout the region, and consideration should be given to the preservation of the more significant of these old buildings and sites.

In particular, at Morrissey and Coal Creeks, interesting ruins of coking* ovens and brick buildings remain as a tribute to early coal processing activities. This area is perhaps of sufficient significance to be considered for designation as an historic site. At Hosmer a potential conflict is developing between residential development and preservation of another coking oven ruins if some prior decisions are not made. These areas should clearly receive some degree of protection as they represent visibly interesting evidence of the early history of the development of this area.

4.1.6 WILDLIFE[1]

The wildlife resource in the East Kootenay area ranks among the best in North America in its variety of big game species and in productivity. While there have been large variations in the abundance of most species, due mainly to human influences, the capability of the land base to produce wildlife remains the highest in Canada.

Hunting and viewing of wildlife are important recreational pursuits in the East Kootenay region. Both have considerable social and economic importance in the region and both have a much larger potential under appropriate management of the resource base.

The future welfare of wildlife in the East Kootenay area will be governed primarily by various human uses of the unalienated winter ranges that remain. These low elevation, valley bottom lands are essential for the winter survival of ungulates, and are usually the lands most in demand for grazing, rural and urban settlement, forestry, access and other developments and uses that conflict with the needs of wildlife.

4.2 RECOMMENDATIONS

Placing an economic value on all of the components of the recreational resource within a region is extremely difficult and is not the objective of this report. The above mentioned examples have been elaborated upon to emphasize areas of potential land use conflicts from the viewpoint of maintaining recreational values in the area. Sensitive resource allocation planning should consider socio-economic factors from both conservation and development points of view.

Recreation resources must be represented in the land management plans for this part of British Columbia. Long range recreational planning on a regional, as well as on a provincial basis, is of prime importance. This planning programme requires a cooperative effort between all government agencies, and public groups that have recreational interests within the region. It is hoped that the type of overall recreational resource information presented in this inventory and report will be of considerable assistance in the development of such plans.

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[1] Smith, W.G. and D.A. Demarchi, personal communication.

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Appendices

Appendix A

PREVIOUS STUDIES DONE BY THE TERRESTRIAL STUDIES BRANCH (TSB), RESOURCE ANALYSIS BRANCH (RAB), AND THE CANADA LAND INVENTORY (CLI) IN THE EAST KOOTENAY REGION

1.	1966 B.C. Recreation Pilot Project, ARDA (Yeomans)	CLI
2.	1968 Recreation Capability Maps, 1:250 000	CLI
3.	1970 Land Capability Analysis Map for the East Kootenay	CLI
4.	1971-72 Recreation Facilities Maps, 82G and J (Murtha)	CLI
5.	1972 East Kootenay Resource Folio	CLI
6.	1975 Recreation Features Inventory (E.K. Region) (Duncan and Duncan)	RAB*
7.	1975 Springbrook Biophysical Folio	RAB*
8.	1977-78 Resource Inventory and Interpretations for Urban Development and Transportation Requirements - S.E. Kootenay Area (provisional copy)	RAB*
9.	1978 Columbia-Windermere Lakes Area - An Overview Study	ELUCS**
10.	Settlement Suitability in the Cranbrook Area (working report) and Cranbrook Settlement Suitability Folio	APD***
11.	In progress - Windermere-Invermere Urban Suitability	APD***

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* formerly Resource Analysis Unit, E.L.U.C. Secretariat
** Environment Land Use Committee Secretariat
*** formerly Resource Analysis Branch

Note: These reports and maps are available from the Map Library, Assessment and Planning Division, Ministry of Environment, Victoria, B.C., V8W 1X4.

Appendix B

LEGEND FOR PHYSICAL CARRYING CAPACITY FOR OUTDOOR RECREATION

CARRYING CAPACITY CLASSES

Class 1 - Very High

These units have a very high carrying capacity for recreational use, and are capable of supporting a wide variety of land and water based activities. They have slight to no limitations, and will suffer little or no damage under "normal" recreational use.

Class 2 - High

These units have a high physical carrying capacity for recreational use and are capable of supporting a fairly wide variety of activities. However, due to minor limitations, they require a higher amount of management input than the very high (Class 1) carrying capacity areas for a similar intensity of use.

Class 3 - Moderate

These units have a moderate carrying capacity for recreational use. As a result, they are not suited to intensive recreational activities. They are capable of supporting most extensive recreational activities.

Class 4 - Low

These units have a low carrying capacity for recreational use. They are not capable of supporting intensive use and extensive use should be very limited.

Class 5 - Very Low

These units have a very low carrying capacity. They have very severe limitations in supporting any amount of recreational use. These units are best avoided where possible.

SOIL LIMITATIONS

Soil Texture is defined in terms of the relative distribution of primary mineral particles (i.e., sand, silt and clay) within a given soil. Also included under soil texture for the physical carrying capacity inventory are gravels (2 to 76 mm in diameter). Soil texture as used for a carrying capacity limitation refers to the dominant texture within 50 cm of the surface.

Texture is directly related to such soil characteristics as drainage, permeability, erodibility, trafficability (compaction), and vegetation productivity (nutrient availability) and, as such, affects the amount and type of recreational use that may occur in a given area.

Sf - Fine Textured Soils, high in clay and silt content, are subject to puddling and compaction when wet, and tend to become sticky and slippery. These soils also dry out slowly after rains. This becomes particularly significant on the level areas needed for playground and campsite development where there is little surface runoff. Fine textured soils often have drainage restrictions. In wet areas, they present severe limitations for septic tank facilities.

Sc - Coarse Textured Soils, soils high in sand content, are often unstable when dry. Vegetation regeneration and maintenance, particularly in high use areas, is often limited by the poor nutrient availability and rapid drainage of these soils. Septic tank suitability is also severely affected by coarse textured soils that are rapidly drained.

Sb - Coarse Materials, may be defined as particles greater than 76 mm (3") in diameter (cobbles, stones and boulders). The limitation classes are based on the percentage by volume of coarse fragments in the upper 50 cm of material. This information may be inferred from soil horizon descriptions as well as from the landform texture modifiers (blocky and rubbly) as described in the Terrain Analysis Classification.

A moderate coarse fragment limitation (50-70% by volume) would seriously limit intensive development but would not likely hinder extensive use (i.e., hiking, wilderness camping). A severe coarse fragment limitation (over 75% by volume) would prohibit most intensive recreational use (i.e. playgrounds, organized campsites) due to clearing and levelling costs and would seriously hinder trail construction.

Sr - Bedrock/Rockiness, refers to the extent of surface area that is covered by bedrock outcrops. Bedrock can include up to 10 cm of unconsolidated material over the rock material. Bedrock limitations affect structure construction and prohibit the use of septic tank facilities. When associated with steep slopes, bedrock prohibits most recreation uses with the exception of rock climing and association activities.

Ss, Sk - Shallow Soils, refers to materials that are shallow to bedrock (Sk) or shallow to an impervious soil horizon (Ss) (less than 1 meter in depth). Shallow soils present many recreational use limitations. Shallow to bedrock areas cannot easily be levelled for playgrounds. Vegetation is usually difficult to establish on shallow soils due to high erosion or an impervious horizon would prohibit septic tank facilities and hinder the construction of roads and buildings.

Sw, Sm - Soil Drainage, refers to the rapidity and extent of water removal from the soil by both internal water movement to subsurface horizons and by surface runoff. The soil drainage classes used in the limitation classes are derived from the Canadian System for Soil Classification. They are defined in terms of (i) occurrence of soil moisture in excess of field capacity; and (ii) the extent of the period during which such excess water is present in the plant root zone.

Soil drainage affects most recreational uses. Poorly and very poorly drained soils (Sw) present severe limitations for any type of facility development (campsites, buildings, playground) due to the cost of subsurface installations. Imperfectly drained soils that are wet for only a portion of the year present a greater limitation to intensive recreational use than to extensive use (i.e. hiking trails). In rapidly drained soils vegetation cover is difficult to establish and maintain. Septic tank suitability is limited by both poorly drained and rapidly drained soils. Surface and groundwater contamination is likely to occur in poorly and very poorly drained areas. Rapid drainage (Sm) may result in groundwater contamination as well as contamination of either adjacent waterbodies or adjacent poorly drained wet areas (bogs or swamps).

Drainage Classes (The System of Soil Classification for Canada)

Rapidly drained - the soil moisture content does not normally exceed field capacity in any horizon except immediately after water additions.

Well drained - the soil moisture content does not normally exceed field capacity in any horizon for a significant part of the year.

Moderately well drained - the soil moisture in excess of field capacity remains for a small but significant period of the year.

Imperfectly drained - the soil moisture in excess of field capacity remains in subsurface horizons for moderately long periods during the year.

Poorly drained - the soil moisture in excess of field capacity remains in all horizons for a large part of the year.

Very poorly drained - free water remains at or with 30 cm (12 inches) of the surface most of the year.

So - Surface Organic Accumulation, is based on depth of organic accumulation. Organic accumulation includes the surface litter horizons (L, F, H) as well as organic soil horizons.

The moderate limitation class seriously limits intensive recreational uses (i.e., organized campsites or cottaging, playgrounds) while extensive development (i.e., hiking trails) requires some construction consideration. Bog, fen or swamp areas (organic accumulations are over 40 cm) are considered to have severe limitations for recreational use, although their feature value is often high, particularly in terms of nature interpretation. Any recreational use in these areas would require considerable development expense (i.e., elevated boardwalk system).

Ts, Tu - Topographic Expression, as used for a carrying capacity limitation, refers to the relief of the map unit. Simple and complex topographies are divided into limitation classes based on degree of slopes. Simple topography (Ts) refers to continuous unidirectional slopes. Complex topography (Tu) refers to multi-directional slopes that form an irregular or variable surface.

The degree of slope greatly affects all uses. Slopes greater than 5° (9%) constitute a severe limitation for playground areas and parking lots. Levelling costs could be very high. Slopes of greater than 9° (16%) can provide serious limitations to picnic areas, campsites and building development. Again the cost of levelling may be very high. These facilities are somewhat more flexible than the first group as they may occupy a small development area. Slopes of over 17° (30%) are limiting for trail development. This could be due to high erosion hazard, as well as high construction and maintenance costs. Slopes of greater than 31° (60%) are severely limiting for almost all uses and developments. Steep slopes, however, can be essential for activities such as downhill skiing, rock climbing and are often desirable for wilderness hiking and associated scenic views.

HYDROLOGIC LIMITATIONS

Hi - Flooding refers to periodic rising and overflowing of water out of a defined channel.

The moderate subdivision includes those areas where flooding may take place during high rainfall or snowmelt period. These floods are likely to occur at least once over a two year period. They occur to a level (bankfull stage) just above the well developed floodplain or its equivalent. Those areas included in the moderate subgroup would be unsuitable for any permanent development such as permanent campgrounds or recreational cottages. Extensive use such as hiking and wilderness camping could usually occur following the snowmelt period.

The severe subdivision includes those areas where flooding may occur in response to limited rainstorms of overnight duration. The floodplain affected would not be accessible during spring melt or high rain period. These areas would be unsuitable for intensive use and suitable for extensive use only during the driest periods of the year. There would be a constant risk of overnight floods occurring.

(Source: Recreation Capability Inventory, Block and Hignett, 1976)

Appendix C

SOIL ASSOCIATION - PHYSICAL CARRYING CAPACITY FOR OUTDOOR RECREATION RELATIONSHIPS

Soil * Association Symbol	Physical Carrying Capacity for Outdoor Recreation		Soil Association Symbol	Physical Carrying Capacity for Outdoor Recreation	
	Class	Limitations		Class	Limitations
AS	3	Sw, Hi, Sc	FQ	4	Hi, Sf, Sw
AZ	3	Sf, Tu	FR	2	Sc
BB	4	Sk, Ts	FS	3	Hi, Sc, Sw
BC	4	Sk, Ts	FT	2	Sc
BF	4	Sk, Ts	FU	3	Hi, Sc, Sw
BH	4	Sk, Ts	FV	3	Hi, Sc, Sw
BK	4	Sk, Ts	FX	2	Sc
BN	4	Sk, Ts	FZ	3	Hi, Sc, Sw
BO	4	Sk, Ts	GB	2	Sc, Tu
BP	4	Sk, Ts	GC	2	Sc, Tu
BS	4	Sk, Ts	GD	2	Sc, Tu
CA	2	Sf	GE	3	Sf, Tu
CAI	3	Ts, Sb	GL	2	Sc, Tu
CB	3	Ts, Sb	GN	2	Sc, Tu
CC	4	Sf, Ts	GR	2	Sc, Tu
CD	3	Sf, Tu	GT	2	Sc, Tu
CE	3	Ts, Sb	GY	2	Sc, Tu
CF	3	Ts, Sc, Sb	GZ	3	Sf, Tu
CG	3	Ts, Sb	H	2	Sc
CH	3	Ts, Sb	K	3	Tu, Sf
CI	3	Ts, Sb	KA	2	Sc, Tu
CJ	3	Ts, Sb	KE	2	Sc, Tu
CK	4	Sf, Ts	KG	2	Sc, Tu
CL	3	Ts, Sb	KO	2	Sc
CLD	3	Ts, Sb	KR	2	Sc, Tu
CM	3	Ts, Sb	KY	2	Sf, Tu
CN	3	Sw, Hi, Sc	L	2	Sc
CO	3	Sf, Tu	LL	3	Sf, Tu
COL	3	Ts, Sb	LN	3	Sf, Tu
COR	3	Ts, Sb	LY	3	Sf, Tu
COY	4	Ts, Sb	M	3	Sf, Tu
CP	3	Ts, Sb	MA	2	Sf
CQ	3	Ts, Sb	MC	3	Tu
CR	3	Ts, Sb	MD	2	Tu
CS	4	Sf, Ts	ME	3	Sf, Tu
CT	4	Sf, Ts	MF	2	Tu
CU	3	Ts, Sb	MG	3	Sf, Tu
CW	3	Ts, Sb	MK	3	Sf, Tu
CX	4	Sf, Ts	ML	3	Sf, Tu
CY	3	Ts, Sb	MM	3	Sf, Tu
CZ	4	Sf, Ts	MN	2	Tu
E	2	Sc	MO	3	Sf, Tu
F	2	Ts, Sc	MP	3	Sf, Tu
FA	3	Hi, Sc, Sw	MR	3	Sf, Tu
FD	3	Hi, Sf, Sw	MS	3	Sf, Tu
FE	3	Hi, Sf, Sw	MT	3	Sf, Tu
FF	3	Hi, Sc, Sw	MU	2	Tu
FJ	4	Hi, Sc, Sw	MW	3	Sf, Tu
FK	3	Hi, Sc, Sw	MX	3	Sf, Tu
FL	3	Tu, Sf	MY	2	Sc
FM	3	Hi, Sf, Sw	MZ	3	Sf, Tu
FO	2	Sf	NW	3	Sw, Hi, Sf
FP	2	Sf	OD	5	So. Sw

Soil Association Symbol	Physical Carrying Capacity for Outdoor Recreation		Soil Association Symbol	Physical Carrying Capacity for Outdoor Recreation	
	Class	Limitations		Class	Limitations
OL	5	So, Sw	RP	4	Sk, Ts
ON	5	So, Sw	RR	5	Sk, Sf, Ts
OS	5	So, Sw	RS	4	Sk, Ts
P	3	Sf, Tu	RT	4	Sk, Ts
RA	5	Sk, Ts	RU	5	Sk, Sf, Ts
RB	4	Sk, Ts	RY	4	Sk, Ts
RC	4	Sk, Ts	S	3	Sw, Hi, Sf
RD	4	Sk, Ts	SA	2	Sc
RE	5	Sk, Sf, Ts	SL	2	Tu
RF	4	Sk, Ts	SN	3	Sf, Tu
RG	4	Sk, Ts	SP	2	Tu
RH	4	Sk, Ts	SS	3	Sf, Tu
RI	5	Sk, Sf, Ts	SY	3	Sf, Tu
RJ	5	Sk, Ts	WY	2	Tu
RK	5	Sk, Sf, Ts	YK	5	Sb, Ts
RN	5	Sk, Sf, Ts	YR	5	Sb, Ts

* See corresponding 1:50 000 soil manuscripts for the East Kootenay area available from the Map Library, Assessment and Planning Division, Ministry of Environment, Parliament Buildings, Victoria, B.C., V8W 1X4.

Appendix D

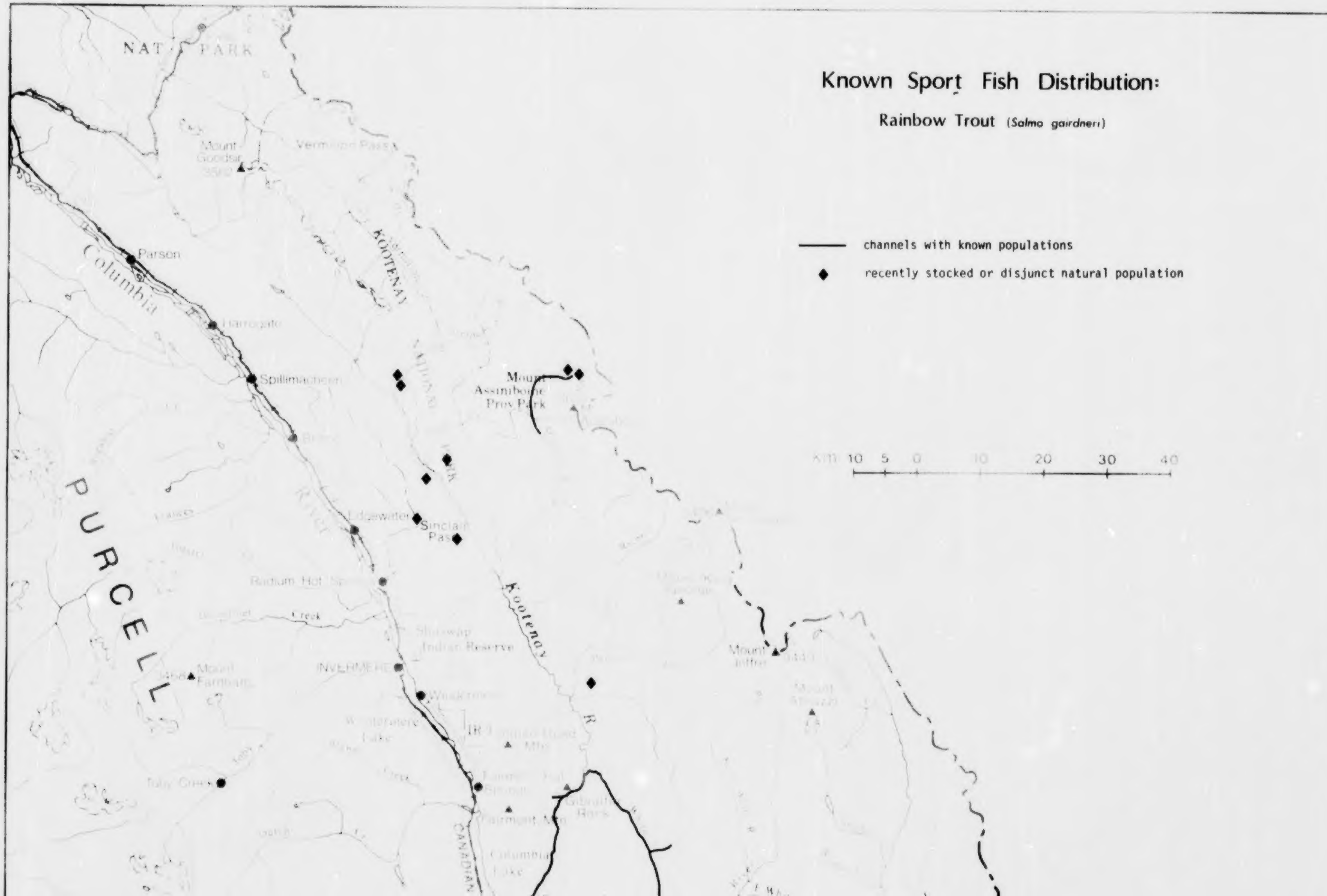
SPORT FISHES OF THE EAST KOOTENAY AREA

The Resource Analysis Branch conducted reconnaissance (1:50 000) aquatic systems surveys on East Kootenay streams from 1975 to 1977. The following maps present a simplified generalization of the sport fish distribution determined by those surveys. Due to variability of access, differences in sampling intensity, and seasonality of migratory populations, some populations may not have been detected.

Where available, other information sources were also utilized. These sources include Fish and Wildlife Branch stream surveys and stocking records, Provincial and Parks Canada records and historic documentation. Anecdotal information from informed sources such as Fish and Wildlife Conservation Officers was also used.

Stocked populations may not reflect natural distributions. In addition, they may not overwinter or reproduce successfully and thus be of a temporary nature. Natural, but disjunct, populations are also more susceptible to catastrophy than are those populations with a larger range. For these reasons, the following maps differentiate stream populations with larger accessible ranges from stocked or disjunct populations.

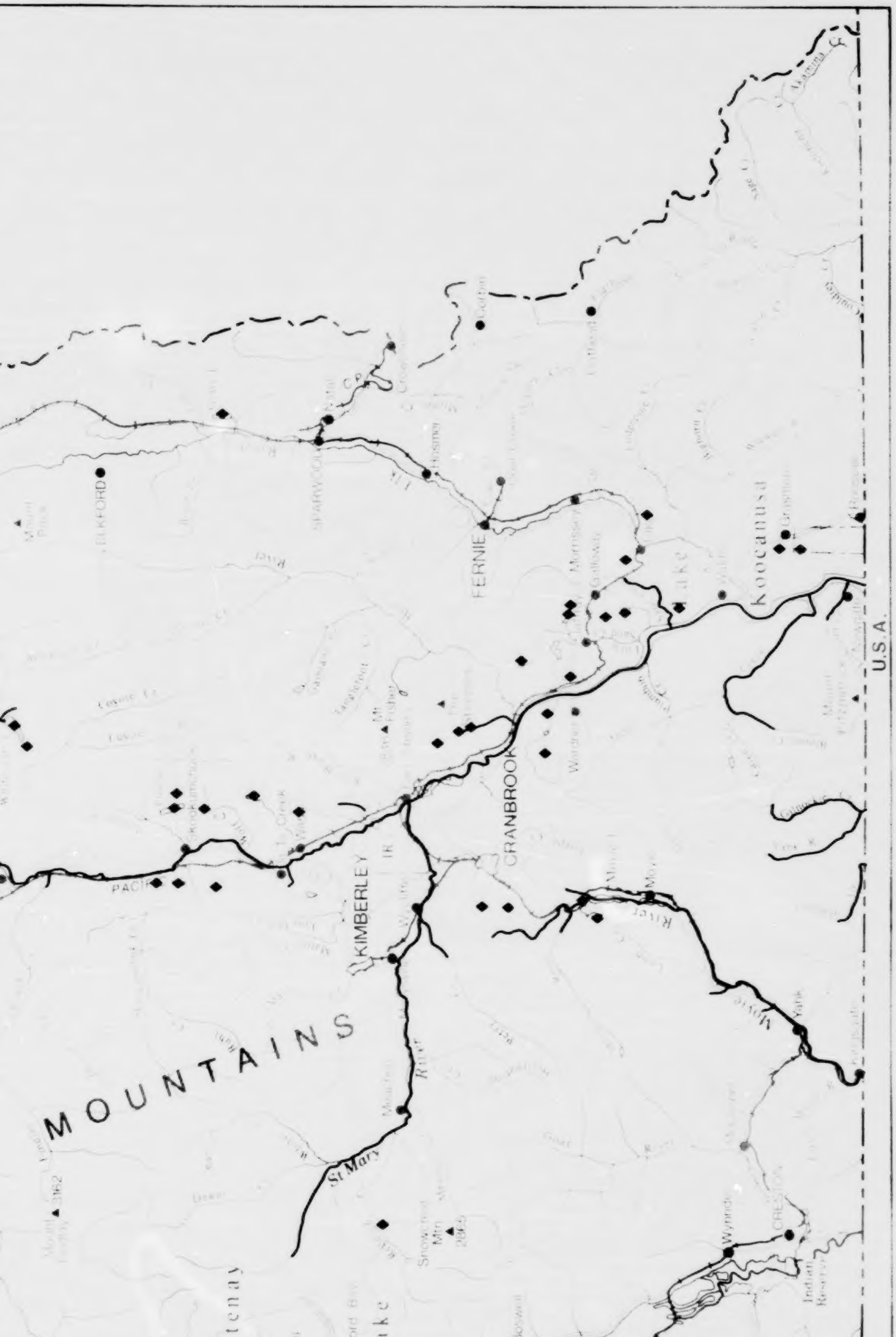
The aquatic systems surveys will be discussed in more detail in Biophysical Resources of the East Kootenay Area: Aquatics (in preparation).



Known Sport Fish Distribution:

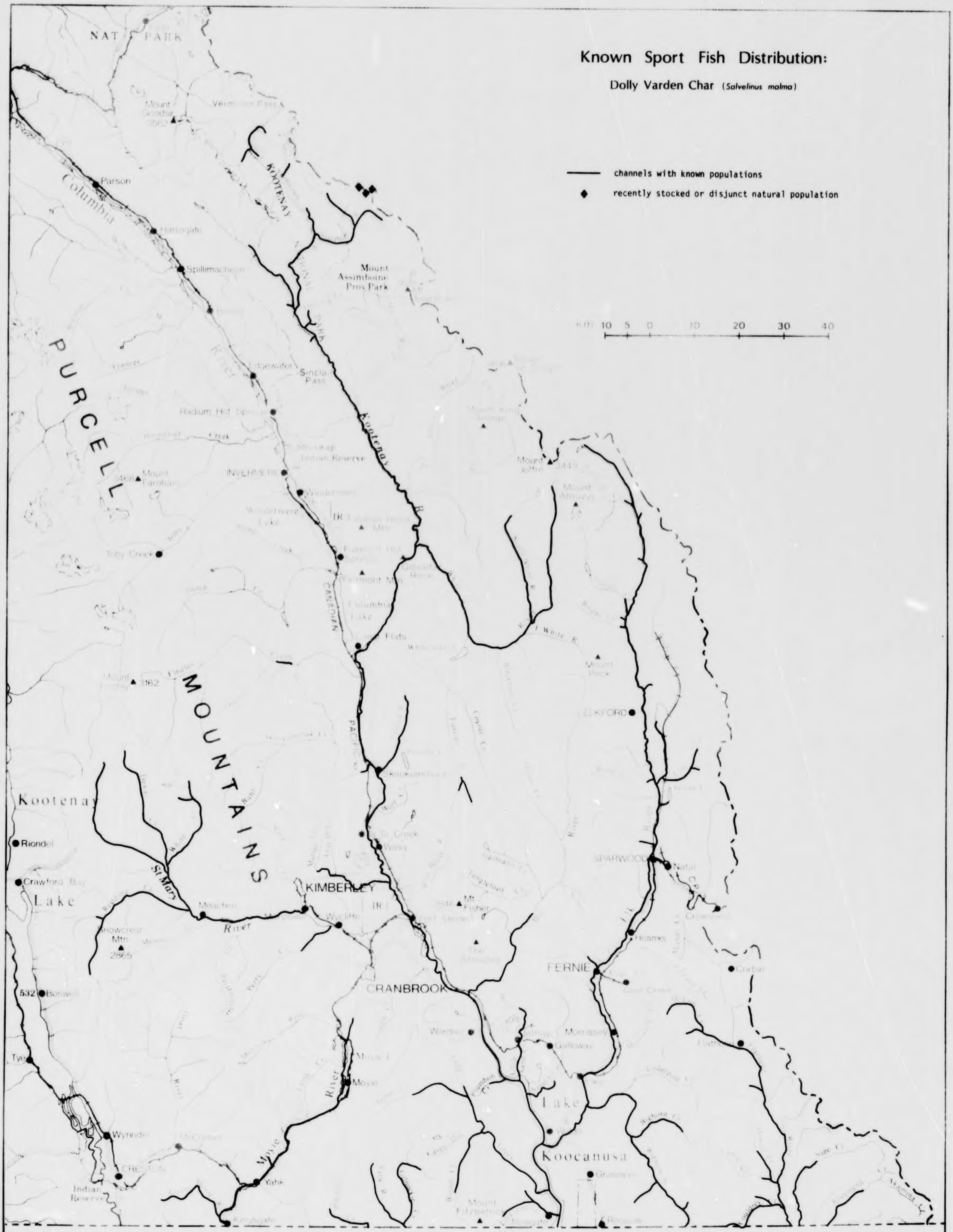
Rainbow Trout (*Salmo gairdneri*)

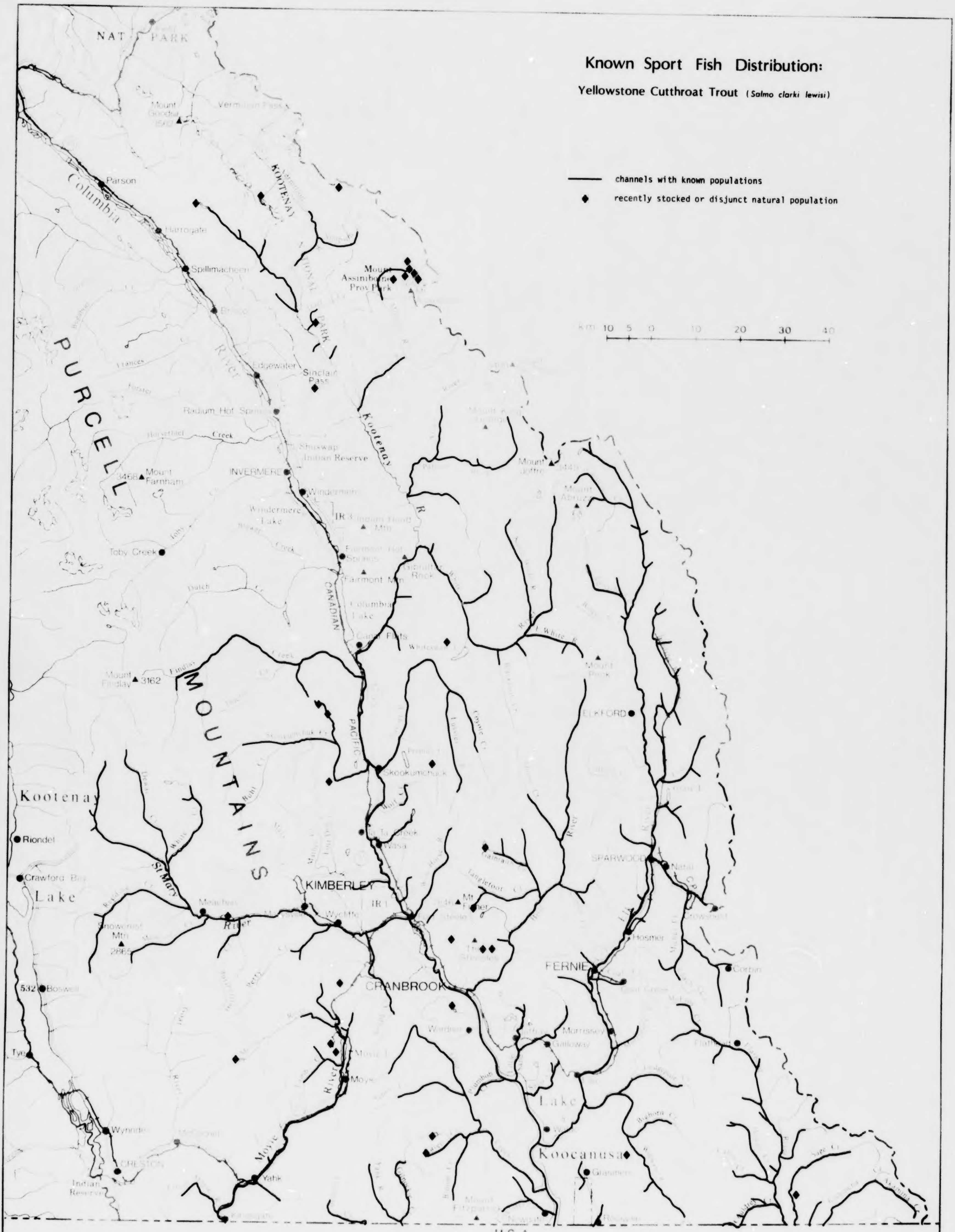
channels with known populations
◆ recently stocked or disjunct natural population
km 10 5 0 10 20 30 40
NAT PARK
Mount Goodsir 3562
Vermilion Pass
KOOTENAY
NATIONAL
PARK
Parson
Columbia
Harrogate
Spillimacheen
Brisco
River
Mount Assiniboine Prov Park
Edgewater
Sinclair Pass
Kootenay
R
PURCELL
Radium Hot Springs
Creek
Shuswap Indian Reserve
INVERMERE
Windermere
Windermere Lake
IR
Mount Farnham 3468
Toby Creek
Fairmont Hot Springs
Fairmont Mtn
Gibraltar Rock
Columbia Lake
CANADIAN
Mount Joffre 3449


ELKFORD
SPARWOOD
Natal
Corbin
Hosmer
FERNIE
Morrissey
Galloway
Elko
Lake
Koocanusa
Grasmere
Roosville
Waldo
Baynes
U.S.A.
Mt Fisher
CRANBROOK
Wardner
KIMBERLEY
Skookumchuck
PACIFIC
Moyie
River
Moyie
Yahk
Kingsgate
MOUNTAINS
St Mary
River
3162
Snowshoe Mtn
3065
Kootenay
Lake
Riondel
Crawford Bay
Boswell
532
Tye
Wynndel
CRESTON
Indian Reserve
Mount Fisher
Flathead
Elk
River

Known Sport Fish Distribution:

Dolly Varden Char (*Salvelinus malma*)

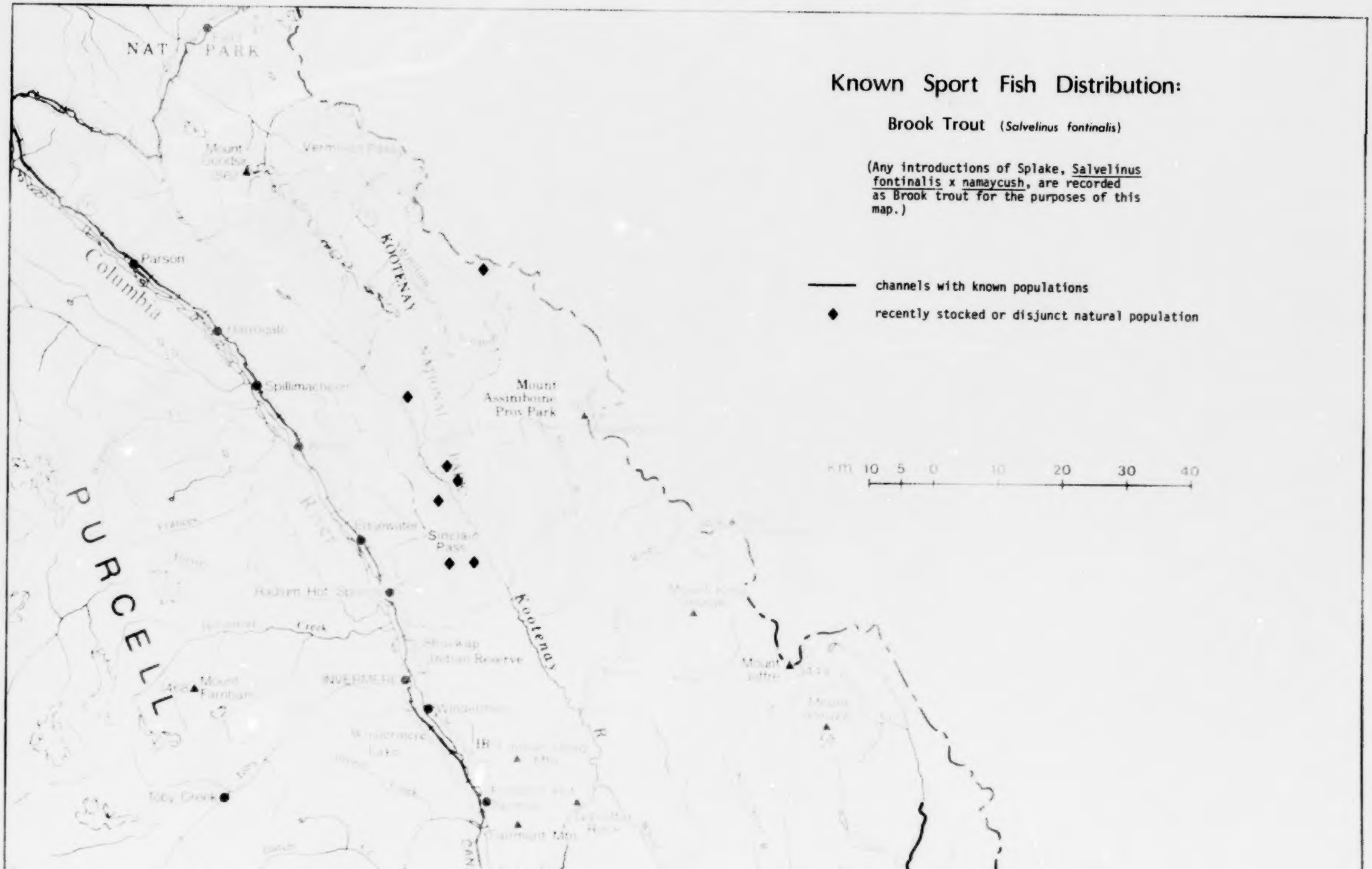

channels with known populations
◆ recently stocked or disjunct natural population
Km 10 5 0 10 20 30 40
NAT PARK
Mount Goodsir 3562
Vermilion Pass
KOOTENAY
Parson
Columbia
Harrogate
Spillimacheen
Mount Assiniboine Prov Park
PURCELL
MOUNTAINS
River
Edgewater
Sinclair Pass
Radium Hot Springs
Creek
Kootenay
Shuswap Indian Reserve
INVERMERE
Mount Farnham 3468
Windermere
Windermere Lake
IR 3
Mount Joffre 3449
Mount Abruzzi
Toby Creek
Fairmont Hot Springs
Fairmont Mtn
Columbia Lake
Canal Flats
CANADIAN
PACIFIC
White R
Mount Peck
Mount Findlay 3162
ELKFORD
Skookumchuck
Kootenay
Riondel
Crawford Bay
Lake
St Mary
Ta Ta Creek
Wasa
SPARWOOD
Natal
KIMBERLEY
IR 1
Mt Fisher 2846
Meachen
River
Wycliffe
Fort Steele
Snowcrest Mtn 2865
Crowsnest
Hosmer
FERNIE
Corbin
CRANBROOK
Coal Creek
532 Boswell
Wardner
Morrissey
Galloway
Flathead
Moyie L
Tye
Moyie
River
Lake
Wynndel
Moyie
Koocanusa
CRESTON
Indian Reserve
Yahk
Grasmere
Kingsgate
Mount Fitzpatrick
Newgate
Roosville
Akamina Cr
U.S.A.



Known Sport Fish Distribution:

Yellowstone Cutthroat Trout (*Salmo clarki lewisi*)

channels with known populations
◆ recently stocked or disjunct natural population
km 10 5 0 10 20 30 40
NAT PARK
Mount Goodsir
Vermilion Pass
KOOTENAY
NATIONAL PARK
Mount Assiniboine Prov Park
Parson
Columbia
Harrogate
Spillimacheen
Brisco
River
Edgewater
Sinclair Pass
Radium Hot Springs
PURCELL
MOUNTAINS
Kootenay
R
Mount King George
Mount Joffre 3449
Mount Abruzzi
Shuswap Indian Reserve
INVERMERE
Windermere
Windermere Lake
3468 Mount Farnham
Toby Creek
IR 3 Fairmont Hot Springs
Fairmont Mtn
Gibraltar Rock
Columbia Lake
Canal Flats
CANADIAN
PACIFIC
White R
Mount Peck
ELKFORD
Mount Findlay 3162
Skookumchuck
Kootenay
Riondel
Crawford Bay
Lake
St Mary
Ta Ta Creek
Wasa
SPARWOOD
Natal
KIMBERLEY
IR 1
Wycliffe
Marysville
River
Mt Fisher
Fort Steele
Tie Lake
Hosmer
Elk
FERNIE
Corbin
Snowcrest Mtn 2865
532 Boswell
CRANBROOK
Wardner
Morrissey
Galloway
Tye
Moyie L
Moyie
Lake
Koocanusa
Wynndel
Moyie
CRESTON
Indian Reserve
Yahk
Kingsgate
Grasmere
Mount Fitzgerald
Newgate
Roosville
U.S.A.



Known Sport Fish Distribution:

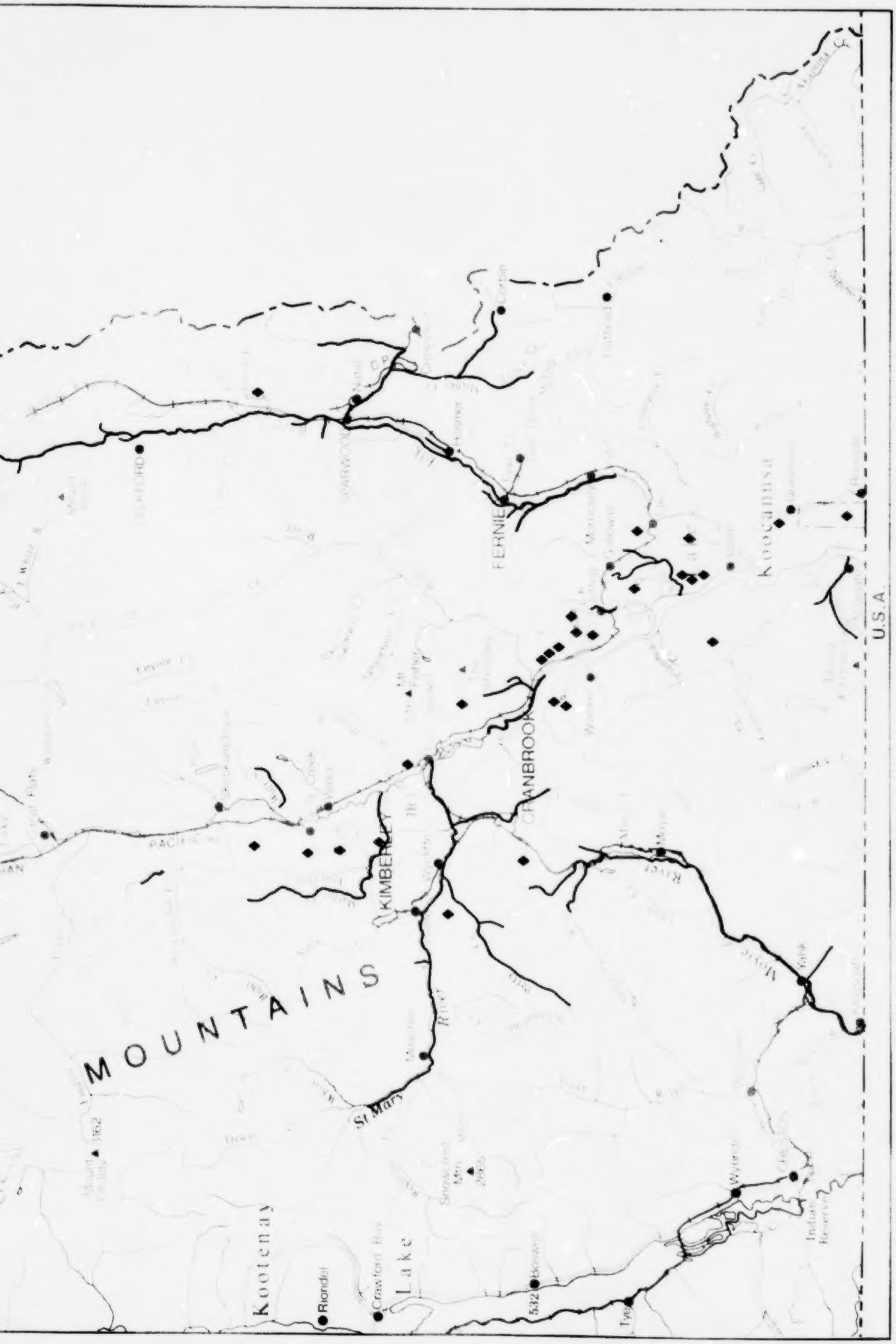
Brook Trout (*Salvelinus fontinalis*)

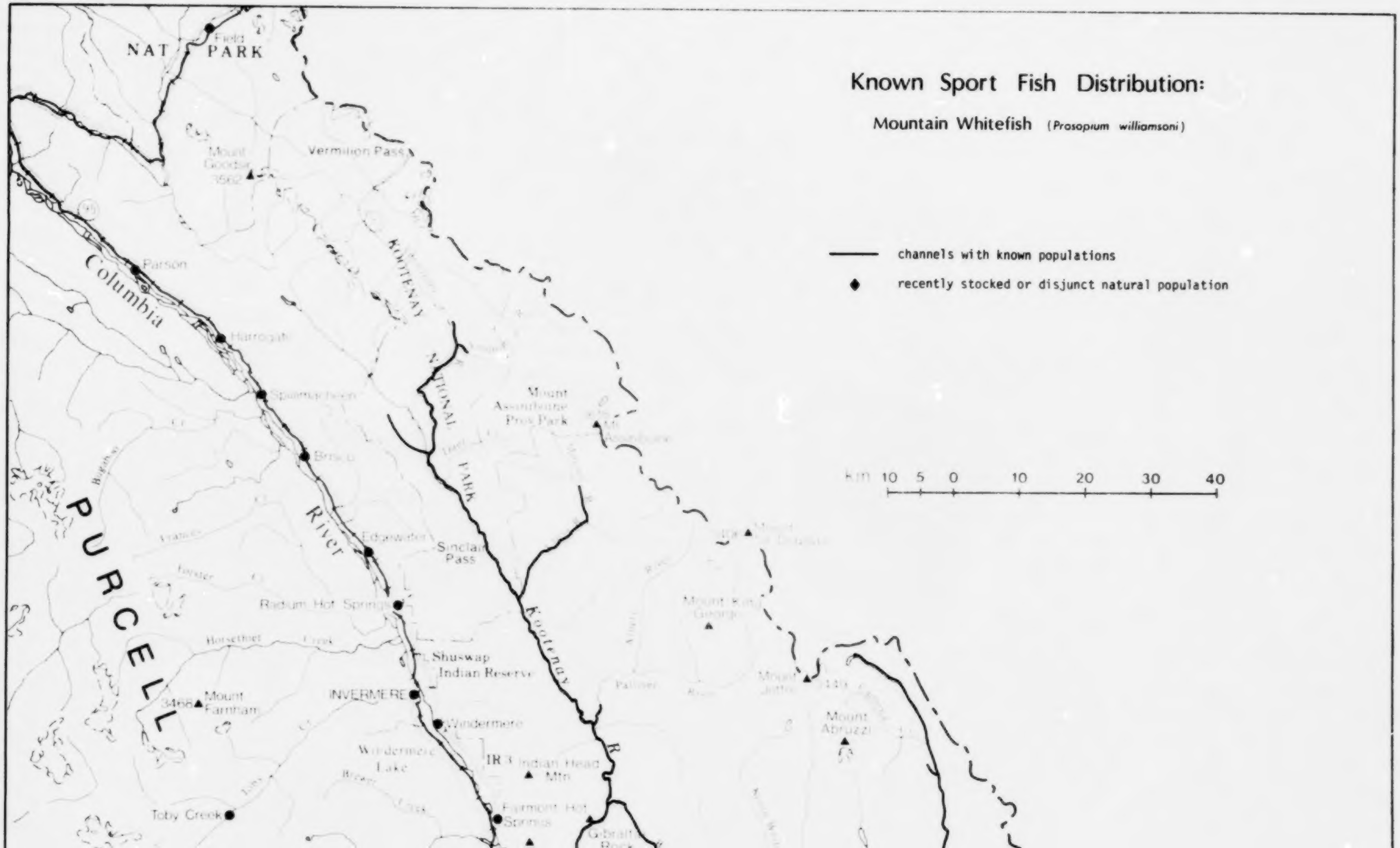
(Any introductions of Splake, Salvelinus fontinalis x namaycush, are recorded as Brook trout for the purposes of this map.)

— channels with known populations

◆ recently stocked or disjunct natural population

Km 10 5 0 10 20 30 40
NAT PARK
Mount Goodsir
Vermilion Pass
KOOTENAY NATIONAL PARK
Parson
Columbia
Harrogate
Spillimacheen
Mount Assiniboine Prov Park
River
Edgewater
Sinclair Pass
PURCELL
Radium Hot Springs
Creek
Kootenay
R
Shuswap Indian Reserve
INVERMERE
Windermere
Windermere Lake
Mount Farnham
Toby Creek
Mount Joffre
IR
Fairmont Mtn

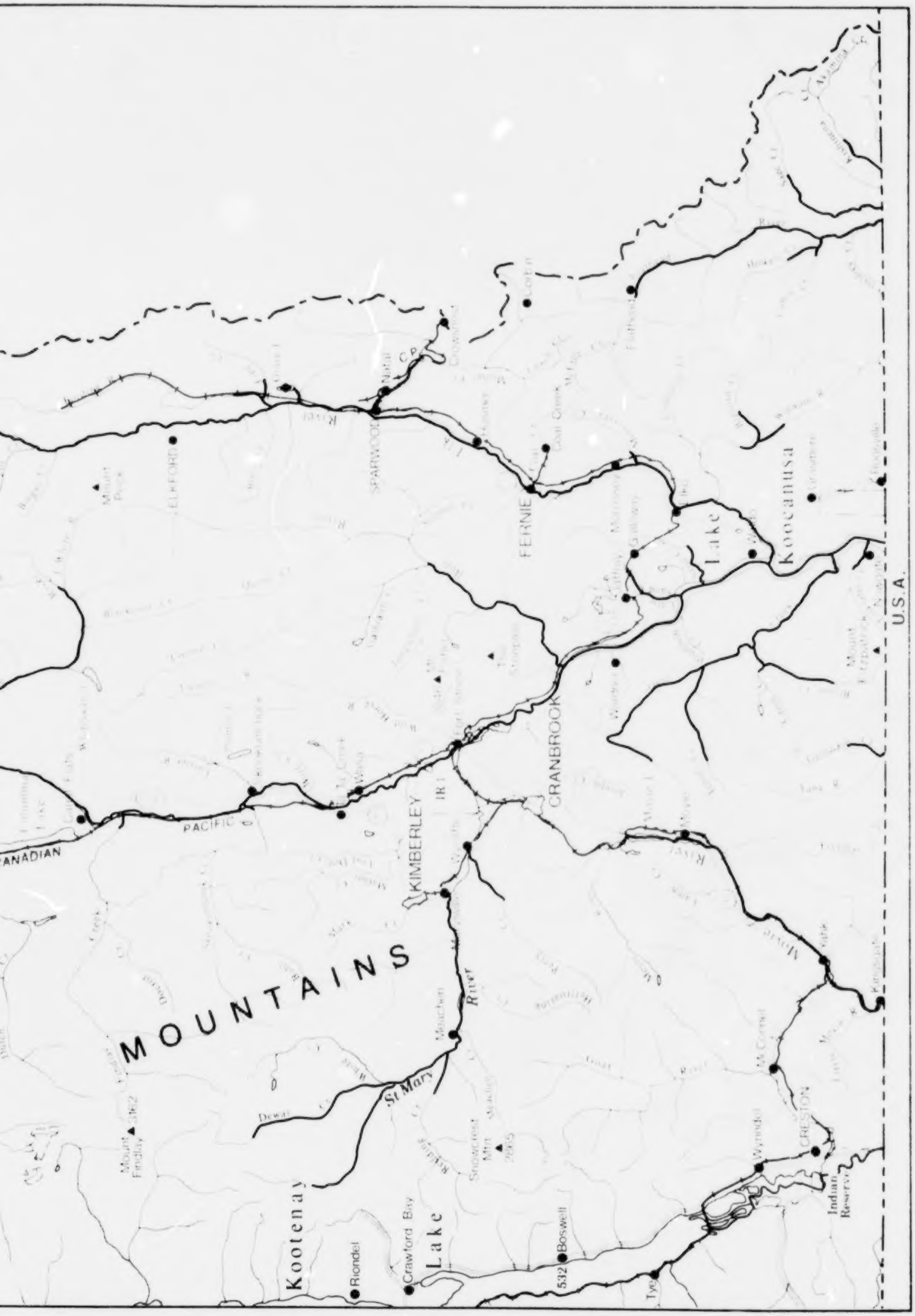

MOUNTAINS
Kootenay
Lake
Koocanusa
U.S.A.
FERNIE
CRANBROOK
KIMBERLEY
SPARWOOD
ELKFORD
Natal
Corbin
Hosmer
Wasa
PACIFIC
St Mary
River
Moyie
River
Yahk
CRESTON
Wynndel
Indian Reserve
Riondel
Crawford Bay
Boswell
Tye
532
3162
Snowcrest Mtn
2665

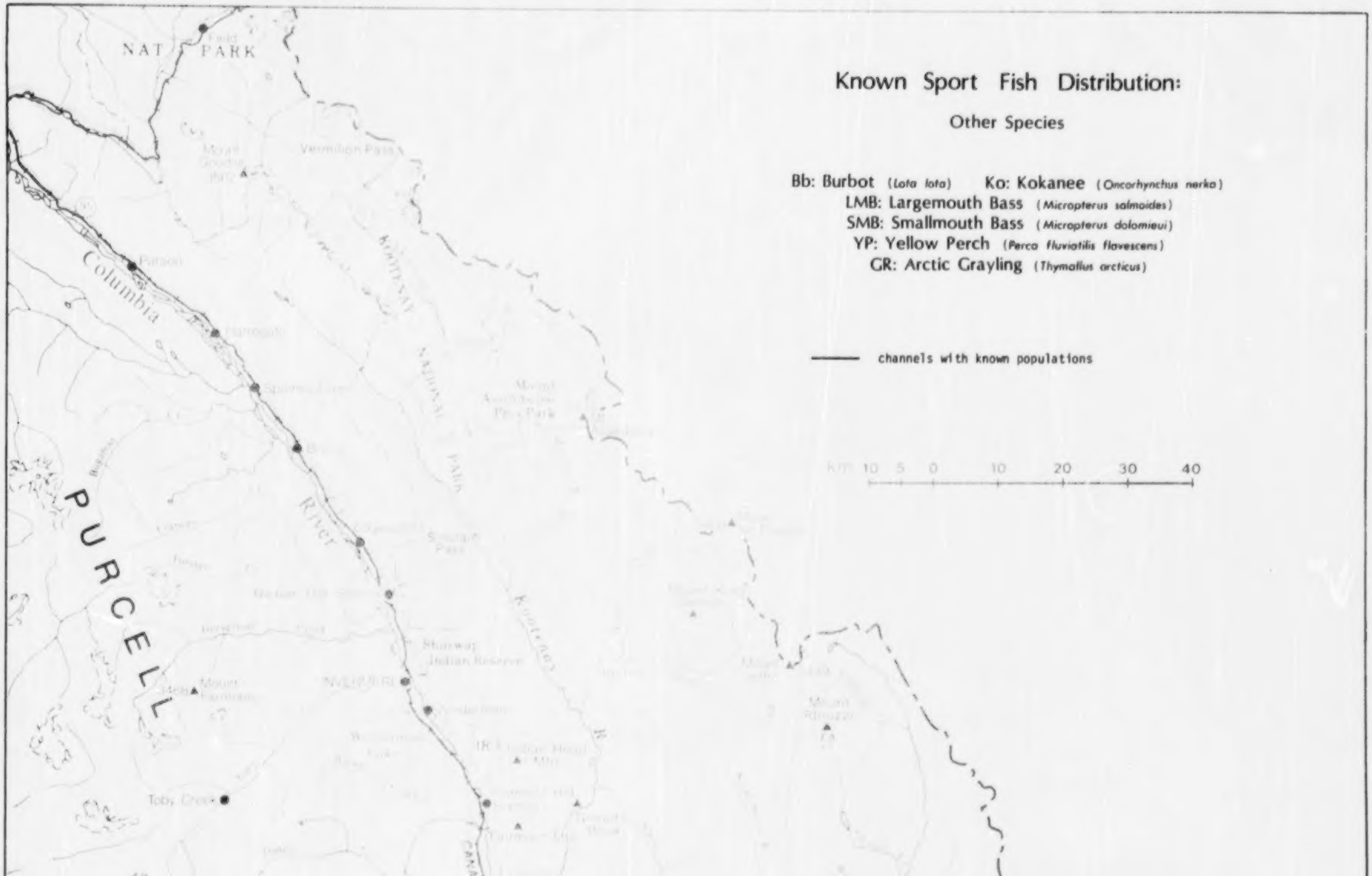


Known Sport Fish Distribution:

Mountain Whitefish (*Prosopium williamsoni*)

channels with known populations
◆ recently stocked or disjunct natural population
km 10 5 0 10 20 30 40
Field
NAT PARK
Mount Goodsir 3562
Vermilion Pass
KOOTENAY
NATIONAL PARK
Mount Assiniboine Prov Park
Mt Assiniboine
Kootenay R
Columbia
River
Parson
Harrogate
Spillimacheen
Brisco
Edgewater
Sinclair Pass
Radium Hot Springs
Horsethief Creek
Shuswap Indian Reserve
INVERMERE
Windermere
Windermere Lake
IR 3
Indian Head Mtn
Fairmont Hot Springs
Gibraltar Rock
Toby Creek
3468 Mount Farnham
PURCELL
Mount King George
Mount Joffre
Mount Abruzzi
Palliser

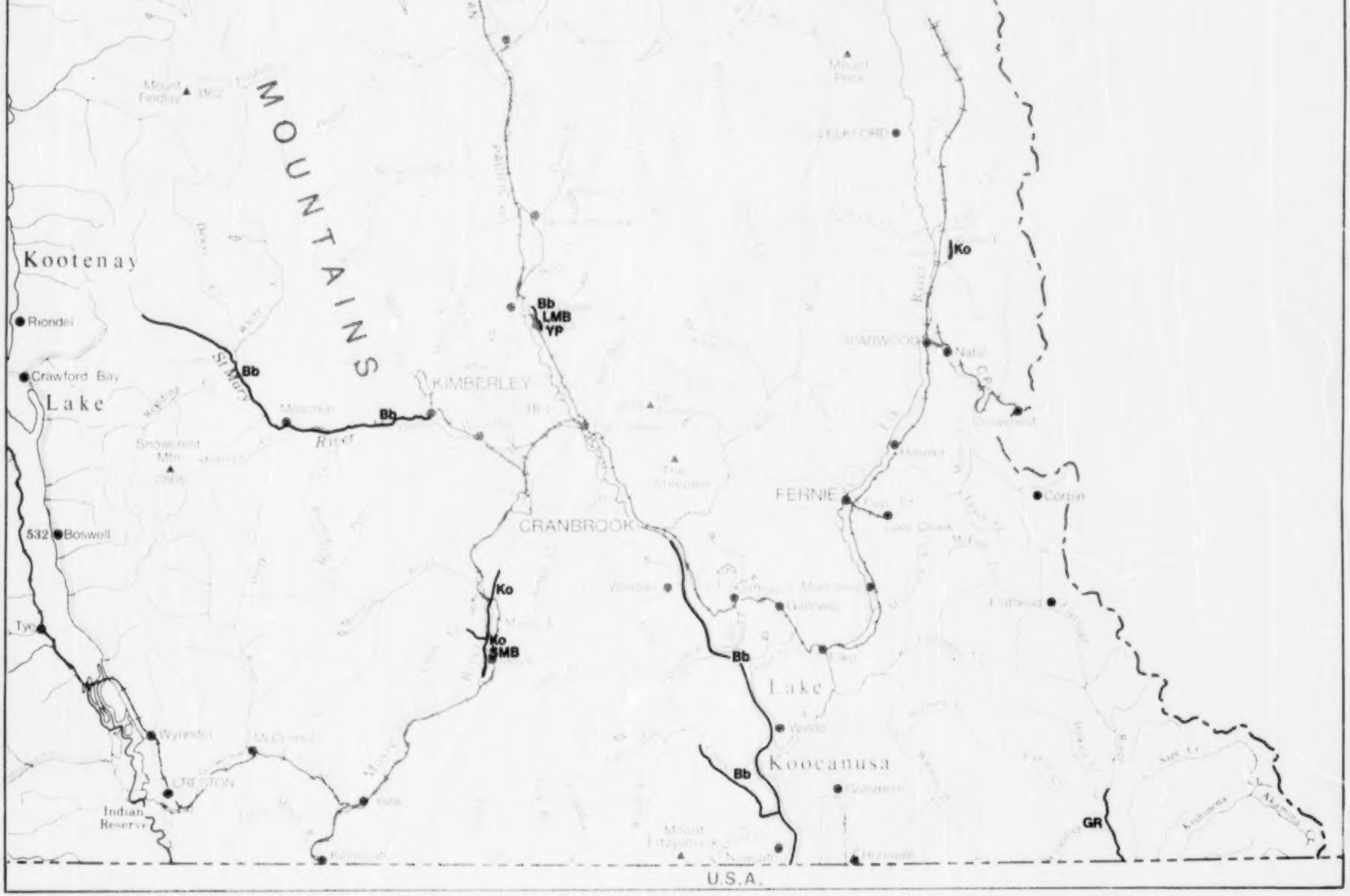

MOUNTAINS
SPARWOOD
ELKFORD
Natal
Corbin
Flathead
Mount Peck
FERNIE
Galloway
Elko
Lake Koocanusa
Grasmere
Roosville
U.S.A.
Mount Fitzpatrick
CRANBROOK
KIMBERLEY
Wardner
Moyie
River
Yahk
Kingsgate
Fort Steele
Wasa
Canal Flats
Columbia Lake
PACIFIC
CANADIAN
CP
Marysville
St Mary
River
Mount Findlay 2142
Snowcrest Mtn 2665
Dewar Cr.
Goat River
Kootenay Lake
Riondel
Crawford Bay
Boswell
532
Tye
Wynndel
CRESTON
Indian Reserve



Known Sport Fish Distribution:

Other Species

Bb: Burbot (Lota lota)
Ko: Kokanee (Oncorhynchus nerka)
LMB: Largemouth Bass (Micropterus salmoides)
SMB: Smallmouth Bass (Micropterus dolomieui)
YP: Yellow Perch (Perca fluviatilis flavescens)
GR: Arctic Grayling (Thymallus arcticus)
channels with known populations
Km 10 5 0 10 20 30 40
NAT PARK
Field
Vermilion Pass
Mount Goodsir
Columbia
Parson
River
KOOTENAY NATIONAL PARK
Mount Assiniboine Prov Park
Sinclair Pass
Kootenay
R
Shuswap Indian Reserve
INVERMERE
Toby Creek
PURCELL
Mount Farnham
CANAL


MOUNTAINS
Kootenay
Lake
Mount Findlay
Riondel
Crawford Bay
Snowcrest Mtn
St Mary
River
Bb
KIMBERLEY
PACIFIC
Bb
LMB
YP
CRANBROOK
The Steeples
532
Boswell
Tye
Wynndel
CRESTON
Indian Reserve
Ko
Ko
SMB
Yahk
Wardner
Galloway
Lake
Koocanusa
Bb
Bb
Waldo
FERNIE
Coal Creek
Hosmer
SPARWOOD
Natal
Ko
ELKFORD
Mount Peck
Elk
River
Crowsnest
Corbin
Flathead
Sage Cr.
Akamina Cr.
Kishinena
GR
Mount Fitzgerald
U.S.A.

Appendix E

ECOLOGICAL RESERVES IN THE STUDY AREA

1. Definition of "Ecological Reserve":

   a. areas suitable for scientific research and educational purposes associated with studies in productivity and other aspects of the natural environment;

   b. areas that are representative examples of natural ecosystems within the province;

   c. areas that serve an example of ecosystems that have been modified by man and that offer an opportunity to study the recovery of the natural ecosystem from such modification;

   d. areas in which rare or endangered nature plants and animals in their natural habitat may be preserved; and

   e. areas that contain unique and rare examples of botanical, zoological, or geological phenomena.

(Source: Ecological Reserves in B.C. by V.J. Krajina, P.A. Larkin, J.B. Foster, D.F. Pearson, Vancouver, Canada, 1974).

2. Location and Description of Ecological Reserves in East Kootenay:

   a. Ecological Reserve No. 19 Name: Mount Sabine

   Location: 50°11'20" N Lat. 115°47'30" W Long.

   NW slopes of Mount Sabine, north of Canal Flats

   Elevation: 1290-1410 m (4300-4700 ft)

   Date Established: May 4, 1971

   Area: ha: 7.9 acres: 19.5

   Biogeoclimatic Zone (Krajina): ESSFx

   Climate (Koppen-Trewartha): Dfc

   Ecosystem Units:
   Mainly plant associations of the order Caricetalia aquatilis - rostratae surrounded by the plan associations of Piceo (engelmannii) - Vaccinietalia membranacei. Soils are Gleysols. Trees: Abies lasiocarpa, Picea engelmannii, Pinus contorta and Populus tremuloides.

   Outstanding Features:
   A well developed sedge marsh, developed in the lowest elevations of the Engelmann spruce - subalpine fir biogeoclimatic zone.

   Air Photo Reference No. B.C. 4230:217

   Map Reference: 82 J/4W (Canal Flats)

   b. Ecological Reserve No. 20 Name: Columbia Lake

   Location: 50°11'40"-12'10" N Lat. 115°49'10"-40" W Long.

   East side of Columbia Lake, 4.8 km (3 miles) NW of Canal Flats, at the trail toward Mount Sabine, WSW exposure.

Elevation: 930-1110 m (3100-3700 ft)

Date Established: May 4, 1971 amended June 2, 1972.

Area: ha: 32.4 acres: 80

Biogeoclimatic Zone (Krajina): IDF

Climate (Koppen-Trewartha):

Ecosystem Units:
A series of meadows growing along streams on limestone (rendzina soils).

Outstanding Features:
Calcicolous vegetation with *Downingia bicornuta* (the first record in Canada), *Parnassia parviflora*, *Castilleja lutescens*, *C. exilis*, *Rosa woodsii*, *Betula occidentalis* and *Juniperus scopulorum*.

Air Photo Reference No. B.C. 4231:45

Map Reference: 82 J/4W (Canal Flats)

c. Ecological Reserve No. 26 Name: Ram Creek

Location: 50°01'40"-02'20" N Lat. 115°35'30"-37'00" W Long.

In East Kootenays, east of Lussier River, 18 km SE of Canal Flats and NE of Skookumchuck (McClean Peak portion of Hughes Range)

Elevation: 1200-1560 m (4000-5200 ft)

Date Established: July 29, 1971

Area: ha:121 acres: 300

Biogeoclimatic Zone (Krajina): (IDFb) - ESSFx

Climate (Koppen-Trewartha): Dfc

Ecosystem Units:
Hot spring vegetation surrounded by forest of transitional area between the IDFb and ESSFa. Pseudotsugetalia menziesii are represented here very little, whereas Piceo (engelmanii) - Vaccinietalia membranacei and Piceo (engelmannii) - Abietetalia lasiocarpae are prevalent. Soils are Brunisol, Rendzina and Gleysol.

Outstanding Features:
Hot springs with unique vegetation, in which poison ivy (*Rhus radicans*) is unexpectedly occurring in the ESSF outside of its normal distribution (in the PPBG zones or in the warmest parts of the IDF zone). *Senecio crassulus* was discovered here in floodplain habitat by J.R. Maze. It was not known from Canada before.

Air Photo Reference No. B.C. 4227-58

Map Reference: 82 J/4E (Canal Flats)

Appendix F

PLANTS OF RECREATIONAL INTEREST FOUND IN THE REGION

Introduction

The Tables included in this section are:

I) Common Edible Plants of the East Kootenay Area
II) Common Wildflowers of the East Kootenay Area
III) Plants with Notable Autumn Colour in the East Kootenay Area
IV) Some Native Poisonous and Nuisance Plants in the East Kootenay Area

These offer information for the recreation resource users. The information may also be used in planning recreational activity areas.

The contents of each table are described in a section preceding it.

Common names for plants are used throughout these tables. A list to reference the common names to botanical names is found immediately following the tables. Nomenclature for common and botanical names for species and families follow R.L. Taylor and B. MacBryde, Vascular Plants of British Columbia (1977). A list of references for the four tables is included following the plant species list.

TABLE I COMMON EDIBLE PLANTS OF THE EAST KOOTENAY AREA

I) Common Edible Plants of the East Kootenay Area

The following table presents some of the more common edible wild plants to be found in the East Kootenay area. Other edible plants do occur in the area but are not prevalent enough to deserve mention here.

The table consists of five columns including common plant names, the botanical family in which the plant is placed, a general description of the plant, the edible parts, their use and preparation and the common habitats in which the plant may be found.

The plants listed are ordered alphabetically by common name. The family names are listed to allow reference to various manuals in particular those published by the British Columbia Provincial Museum (see references). The family name shows the relationship of each plant to other plants that may have similar flowers and appearance.

The description of the plant is meant as an aid to identification. Care should be taken to ensure proper identification of any plants before consumption. Some edible plants look very similar to plants that are poisonous for people. For example the poisonous plant Douglas water-hemlock may be mistaken for the edible plant, common cow-parsnip. Manuals such as C.L. Hitchcock and A. Cronquist's Flora of the Pacific Northwest (1974) and the British Columbia Provinicial Museum handbooks on plant families are useful references for identification although they may be somewhat technical for use by the lay person.

The "Edible Part(s) and Use" category is a guide to what parts are edible although taste will be a personal preference in any particular case. Information on preparation and use is included here. For a more detailed explanation of plant use refer to A.F. Szczawinski and G.A. Hardy's Guide to Common Edible Plants of British Columbia (1973). This book has also been freely consulted for information in this table.

The "Common Habitats" column gives a general description of where any particular plant may be found. Some of these plants are widespread in distribution and will be easy to find while others may be abundant only in scattered areas. Searching for these plants may be as enjoyable as eating them.

Table I) COMMON EDIBLE PLANTS OF THE EAST KOOTENAY AREA

COMMON NAME*	FAMILY*	DESCRIPTION**	EDIBLE PART(S) AND USE	COMMON HABITATS
American red raspberry	rose	spreading shrub; sharp thorns on stems; white flowers; red berries	berries - fresh or in jelly, pies,or as a drink; leaves - as tea; young shoots - eaten fresh	roadside areas - middle elevations
American stinging nettle	nettle	tall herb; coarsely-toothed leaves with stinging bristles; inconspicuous, green flowers	young shoots - boiled, used as spinach or used as tea	stream side areas
arrow-leaved balsamroot	aster	perennial herb; large, triangular, basal leaves; large, yellow flowers	roots - may be roasted; whole seeds - fresh or pounded into a meal	dry exposed slopes at low elevations
black blueberry	heath	densely-branched shrub; oblong, toothed leaves; creamy-pink flowers; purplish berries	berries - fresh, as preserves or as a drink	moist forested areas
blue elder	honeysuckle	tall shrub; leaves divided into large leaflets; small, numerous white flowers; bluish-black fruit	berries - in pies and jelly or steeped raw in water to make a drink	moist forested areas and logged areas
broad-leaved willowherb	evening-primrose	perennial herb to 2 feet high; narrow leaves, showy pink and purple flowers	new shoots and young fleshy leaves - eaten fresh or as salad greens	river banks; subalpine and alpine meadows
Canadian bunchberry	dogwood	trailing herb; whorled, prominently veined leaves; white, dogwood-like flowers; orange berries	berries - fresh	moist forested areas
choke cherry	rose	tall shrub; oval-shaped leaves; many, white flowers in long clusters; red to black fruit	berries - used in jelly combined with other fruit	dry exposed slopes, low to middle elevations
clover	pea	perennial herb; leaves made up of three leaflets; white, pink or red flower clusters	roots - dried and smoked; leaves - in salad	open meadows; roadside areas

* plant names used (common and family) follow Taylor, R.L. and MacBryde, B. Vascular Plants of British Columbia, 1977.

** The plant descriptions used in this table are only aids to plant identification. Care must be taken in assuring correct identification before any attempt is made to eat any parts of any plant.

Table I) COMMON EDIBLE PLANTS OF THE EAST KOOTENAY AREA (cont'd)

COMMON NAME*	FAMILY*	DESCRIPTION**	EDIBLE PART(S) AND USE	COMMON HABITATS
common cattail	cattail	tall herb; broad, sword-like leaves; flowers resemble a cat's tail	young shoot - strip outer sheath and eat white part inside; central part of rootstock - dried, ground and made into meal	in shallow water in ponds or marshes
common cow-parsnip	parsley	perennial plant up to 10 feet high; large leaves; small white flowers in large umbrella-like structure	flower stems - fresh when picked and peeled (before flowers open)	lower part of avalanche areas; wet areas
common dandelion	aster	perennial herb; coarsely toothed leaves; yellow flowers	young leaves - in salad or cooked; roots - in salad or roasted and ground, used as a coffee substitute	open fields and roadside areas
common juniper Rocky Mtn. juniper	cypress	evergreen shrubs; scale-like leaves; fruit - dark blue, berry-like cone	fruit - for flavouring gin and other cordials, or dried and ground to make mush and cake	lower elevations and dry exposed slopes
common labrador tea	heath	evergreen shrub; oblong leaves covered by rust-coloured hairs beneath; white flowers in clusters	leaves-as tea substitute	not common; wet, forested areas
common saskatoon	rose	shrub up to 20 feet high; oblong coarsely-toothed leaves; white flowers; clusters of purplish berries	berries - fresh or used for jellies, pies, or dried	low elevations and dry exposed slopes
common silverweed	rose	low perennial plant; spreads by runners; leaves with many leaflets, silvery beneath, green above; yellow flowers	roots raw, boiled or roasted	wet meadows and pond-side areas
creeping Oregon-grape	barberry	evergreen shrubs; compound holly-like leaves; yellow flowers in terminal clusters; blue berries	berries - in a jelly or eaten fresh	low to middle elevations; forested areas

* plant names used (common and family) follow Taylor, R.L. and MacBryde, B. Vascular Plants of British Columbia, 1977.

** The plant descriptions used in this table are only aids to plant identification. Care must be taken in assuring correct identification before any attempt is made to eat any parts of any plant.

Table I) COMMON EDIBLE PLANTS OF THE EAST KOOTENAY AREA (cont'd)

COMMON NAME*	FAMILY*	DESCRIPTION**	EDIBLE PART(S) AND USE	COMMON HABITATS
currant or gooseberry black swamp gooseberry	currant	shrubs; maple-shaped leaves; stems often have spines or prickles; variety of flower colours and berry colours	berries - used for jelly or eaten fresh	variety of habitats; (black swamp gooseberry found in moist forested areas)
dwarf blueberry	heath	trailing shrub; spathulate-shaped leaves; white to pink flowers; dark blue berries	berries - fresh	moist forested areas
field mint	mint	perennial herb; opposite leaves; square stems; light purple or white flowers	leaves - in a tea	wet meadows, lakeshores or wet open forest
fireweed	evening-primrose	perennial herb up to 6 feet tall; narrow leaves; showy pink and purple flowers	young leaves as salad greens; leaves - dried for tea; inner pulp of stalk - fresh	logged and burned areas
grouseberry	heath	low shrub; broomlike in appearance; small pink flowers; small red berries	fruit - fresh	very common at middle to high elevations, especially on steep slopes
high bush cranberry	honeysuckle	tall shrub; three-lobed leaves;white flowers; red or orange berries	fruit - fresh or in jellies	streamside areas at middle elevations
kinnikinnick	heath	evergreen, trailing shrub forming low mats; leaves oblong to spathulate; pink flowers; red berries	berries - when cooked; leaves - used for tobacco when dried	common; often on dry exposed slopes
lodgepole pine	pine	tree; leaves needle-like in bundles of 2; small cones; scaly bark	inner bark - can be eaten fresh or dried in the spring; seeds - fresh	common throughout area
mountain cranberry	heath	low, mat-forming dwarf shrub; leathery, elliptic leaves; white or pink flowers; bright red berries	berries - fresh or in jellies or sauces	found in vicinity of Kootenay National Park

* plant names used (common and family) follow Taylor, R.L. and MacBryde, B. Vascular Plants of British Columbia, 1977.

** The plant descriptions used in this table are only aids to plant identification. Care must be taken in assurring correct identification before any attempt is made to eat any parts of any plant.

Table I) COMMON EDIBLE PLANTS OF THE EAST KOOTENAY AREA (cont'd)

COMMON NAME*	FAMILY*	DESCRIPTION**	EDIBLE PART(S) AND USE	COMMON HABITATS
mountain sorrel	buckwheat	perennial herb; large, thick root stock; kidney-shaped leaves; small red or green flowers in terminal cluster	leaves - fresh or cooked; can be put in soups	high elevations; wet meadows
nodding onion	lily	perennial herb; leaves narrow and tubular; nodding pink flowers in umbel	bulbs - used for flavoring	low elevations and dry exposed slopes
ponderosa pine	pine	tree; leaves needle-like in bundles of three; leaves up to 10 inches in length; large cones	seeds - fresh or made into a bread or biscuit	low elevation in Rocky Mountain Trench area
rose prickly rose baldhip rose Woods' rose	rose	shrubs with thorny stems; leaves divided into toothed leaflets; conspicuous pink flowers; orangy-red fruit	fruit (hips) - for jelly or marmalade	variety of habitats, low to middle elevations
soopolallie	oleaster	shrub; leaves - green above with rusty brown scales below; inconspicuous yellow flowers; orange or red berries	berries - when beaten with egg-beater and mixed with sugar	very common; forested areas; low to middle elevations
thistle	aster	tall, biennial herb; prickly leaves; mauve to purple flowers	roots - when roasted	waste areas, wet meadows
three-spot mariposa lily	lily	perennial herb; narrow, grass-like leaves; showy, cream-coloured flowers	bulbs - when boiled, roasted or steamed	low to high elevations; variety of habitats
western thimbleberry	rose	shrub; large leaves that resemble maple leaves; large, white flowers; red fruit, hemispherical in shape	berries - fresh or in jelly; young shoots - eaten fresh	moist forested areas
wood strawberry blue-leaved wild strawberry	rose	low perennial plants; spreads by runners; leaves composed of 3 leaflets; white flowers; red fruit	berries - fresh or crushed in water as a drink; leaves-dried for tea	common; often in open woods

* plant names used (common and family) follow Taylor, R.L. and MacBryde, B. Vascular Plants of British Columbia, 1977.

** The plant descriptions used in this table are only aids to plant identification. Care must be taken in assuring correct identification before any attempt is made to eat any parts of any plant.

TABLE II COMMON WILDFLOWERS OF THE EAST KOOTENAY AREA

The tables of this section offer a list of some of the more conspicuous and common wildflowers by various habitats. The habitats broadly correspond to elevational areas. Table A) "Flowers of Subalpine and Alpine Meadows (Wet Areas) and Table B) "Flowers of Dry, Open Subalpine and Alpine Areas" correspond to high elevation areas generally above 2100 metres. Table C) "Flowers of Subalpine Forested Areas" corresponds to forested areas between approximately 1400 and 2100 metres. Table D) "Flowers of Montane Forested Areas" correspond to forested areas generally below 1400 metres. Table E) Flowers of Open Ponderosa Pine Forests" corresponds to valley bottom areas mainly in the Rocky Mountain Trench. This last area is typified by either open tree stands or dry grassland areas that have been created by fires or grazing. The plants included in these tables are related to the habitat in which they are most commonly found in. They may occasionally be found in the other areas mentioned. Some plants common to more than one area have been repeated under each appropriate habitat.

Dominant flower colours are listed for each plant. For each habitat the approximate months of flowering for each plant are also given. The order of arrangement of the lists is from earliest blooming plants to late blooming plants so that for each habitat listed one may be able to go at a certain time of the year and see the plants indicated in flower.

For photographs, drawing, diagrams and identification of any particular plant the following books may be referred to: Wildflowers of British Columbia (1973), Guide to the Trees and Shrubs of British Columbia (1973), Flora of the Pacific Northwest (1973), Rocky Mountain Wildflowers (1974), The Heather Family of British Columbia (1962), The Orchids of British Columbia (1959), The Figwort Family of British Columbia (1974), The Pea Family of British Columbia (1974), and The Rose Family of British Columbia (1973).

Table II) COMMON WILDFLOWERS OF THE EAST KOOTENAY AREA[1]

A) Flowers of Subalpine and Alpine Meadows (wet areas)[2,3]		Approximate Flowering Dates					
COMMON NAME*	FLOWER COLOUR	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
western spring beauty	white		X	X			
yellow glacier lily	yellow		X	X			
white marsh-marigold	white			X	X		
western pasqueflower	white			X	X		
white globeflower	white			X	X		
Sitka valerian	white			X	X		
orange false dandelion	orange				X	X	
Indian paintbrush	red, yellow				X	X	
alpine Indian paintbrush	red				X	X	
subalpine fleabane	purple + yellow				X	X	
northern gentian	purple				X	X	
shrubby cinquefoil	yellow				X	X	
arrow-leaved ragwort	yellow				X	X	

B) Flowers of Dry, Open Subalpine and Alpine Areas[2,3]		Approximate Flowering Dates					
COMMON NAME*	FLOWER COLOUR	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
three-spot mariposa lily	white			X	X		
white mountain-avens	white			X	X	X	
woolly pussytoes	white				X	X	
Merten's cassiope	white				X	X	
broad-leaved willowherb	pink				X	X	
sulphur-flowered umbrella-plant	yellow				X	X	
Lyall's goldenweed	yellow				X	X	
mountain forget-me-not	blue				X	X	
silky phacelia	purple				X	X	
red mountain-heather	red				X	X	
cream mountain-heather	yellow				X	X	
blue-leaved cinquefoil	yellow				X	X	
shrubby cinquefoil	yellow				X	X	
purple mountain saxifrage	purple				X	X	
moss campion	red				X	X	

* plant names used follow
Taylor, R.L. and MacBryde, B.
Vascular Plants of British Columbia
University of British Columbia, 1977

1) For descriptions and habitats of these plants, see the references listed.

2) The flowers mentioned are placed in the most common area in which they are found. They may occur in other areas as well, but are not as common.

3) This area corresponds approximately to the ALPINE Tundra Zone, the krummholz subzone of the SUBALPINE Engelmann Spruce-Alpine Fir Zone and some of the upper areas of the subzone lacking seral Douglas-fir of the SUBALPINE Engelmann Spruce-Alpine Fir Zone as described in the Soils and Vegetation Report for the East Kootenay area.

Table II) COMMON WILDFLOWERS OF THE EAST KOOTENAY AREA[1] (cont'd)

C) Flowers of Subalpine Forested Areas (above 1400 metres)[2,3]		Approximate Flowering Dates					
COMMON NAME*	FLOWER COLOUR	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
yellow glacier lily	yellow		X	X			
heart-leaved arnica	yellow			X	X		
broad-leaved arnica	yellow			X	X		
northern twinflower	pink			X	X		
twinberry honeysuckle	yellow			X	X		
Utah honeysuckle	yellow			X	X		
smooth pacific menziesia	orange			X	X		
one-flowered wintergreen	white			X	X		
fringed grass-of-parnassus	white			X	X		
common pink pyrola	pink			X	X		
green pyrola	green			X	X		
blue elder	white			X	X		
birch-leaved spirea	white			X	X		
cucumberroot twistedstalk	white			X	X		
yellow wood violet	yellow			X	X		
evergreen yellow violet	yellow			X	X		
Canadian bunchberry	white			X	X	X	
fireweed	pink			X	X	X	
common cow-parsnip	white			X	X	X	
white-flowered rhododendron	white			X	X	X	
bear-grass	white				X		
common western pipsissewa	pink				X	X	
blue-bead clintonia	white				X	X	
showy aster	blue				X	X	X
unifoliate-leaved foamflower	white				X	X	X

* plant names used follow
Taylor, R.L. and MacBryde, B.
Vascular Plants of British Columbia
University of British Columbia, 1977

1) For descriptions and habitats of these plants, see the references listed.

2) The flowers mentioned are placed in the most common area in which they are found. They may occur in other areas as well, but are not as common.

3) This area corresponds approximately to the subzone lacking seral Douglas-fir of the SUBALPINE Engelmann Spruce-Alpine Fir Zone and upper parts of the subzone with seral Douglas-fir of the SUBALPINE Engelmann Spruce-Alpine Fir Zone as described in the Soils and Vegetation Report for the East Kootenay area.

Table II) COMMON WILDFLOWERS OF THE EAST KOOTENAY AREA[1] (cont'd)

D) Flowers of Montane Forested Areas (below 1400 metres)[2,3]		Approximate Flowering Dates					
COMMON NAME*	FLOWER COLOUR	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
common saskatoon	white		X	X			
fairy slipper	pink + white		X	X			
rough-fruited fairybells	yellow		X	X			
creeping Oregon-grape	yellow		X	X			
choke cherry	white		X	X			
star-flowered false Solomon's-seal	white		X	X			
early blue violet	blue		X	X			
western blue clematis	blue		X	X	X		
blue-leaved wild strawberry	white		X	X	X		
Woods' rose	pink		X	X	X		
few-flowered shooting-star	pink + white		X	X	X		
false Solomon's-seal	white		X	X	X		
common dandelion	yellow		X	X	X		
clover	white, pink		X	X	X	X	
Sitka columbine	orange + yellow			X	X		
snowbush ceanothus	white			X	X		
western red-oiser dogwood	white			X	X		
small yellow lady's-slipper	yellow			X	X		
mountain lady's-slipper	white			X	X		
cream-coloured peavine	white			X	X		
oxeye daisy	white			X	X		
wood lily	red			X	X		
northern twinflower	pink			X	X		
Utah honeysuckle	yellow			X	X		
lupine	purple			X	X		
prickly rose	pink			X	X		
baldhip rose	pink			X	X		
Rocky Mountain ragwort	yellow			X	X		
birch-leaved spirea	white			X	X		
western thimbleberry	white			X	X		
Canada violet	white			X	X		
heart-leaved arnica	yellow			X	X	X	
common harebell	blue			X	X	X	
fireweed	pink			X	X	X	
sulphur hedysarum	yellow			X	X	X	
showy aster	blue				X	X	X
Douglas' aster	blue				X	X	X
Indian paintbrush	red, yellow			X	X	X	X

* plant names used follow
Taylor, R.L. and MacBryde, B.
Vascular Plants of British Columbia

1) for descriptions and habitats of these plants, see the references listed.

2) The flowers mentioned are placed in the most common area in which they are found. They may occur in other areas as well, but are not as common.

3) This area corresponds approximately to the subzone lacking seral ponderosa pine of the INTERIOR Douglas-fir Zone and the subzone with seral Douglas-fir of the SUBALPINE Engelmann Spruce-Alpine Fir Zone as described in the Soils and Vegetation Report for the East Kootenay area.

Table II) COMMON WILDFLOWERS OF THE EAST KOOTENAY AREA[1] (cont'd)

E) Flowers of Open Ponderosa Pine Forests[2,3]		Approximate Flowering Dates					
COMMON NAME*	FLOWER COLOUR	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
common saskatoon	white	X	X	X			
arrow-leaved balsamroot	yellow	X	X	X			
old man's whiskers	pink	X	X	X			
creeping Oregon-grape	yellow	X	X	X			
antelope bush	yellow	X	X	X			
Pacific anemone	white		X	X			
short-beaked false dandelion	yellow		X	X	X		
Montana delphinium	purple + white		X	X	X		
shaggy fleabane	white		X	X	X		
parsnip-flowered umbrella plant	yellow		X	X	X		
bitterroot lewisia	red		X	X	X		
yellow penstemon	yellow		X	X	X		
prairie crocus	purple		X	X	X		
false salsify	yellow		X	X	X		
pussytoes	white		X	X	X	X	
three-spot mariposa lily	white			X	X		
hairy golden aster	yellow			X	X		
brown-eyed Susan	yellow + brown			X	X	X	
great mullein	yellow			X	X	X	
slender hawk's-beard	yellow				X	X	
common rabbitbrush	yellow				X	X	X

* plant names used follow
Taylor, R.L. and MacBryde, B.
Vascular Plants of British Columbia
University of British Columbia, 1977

1) for descriptions and habitats of these plants, see the references listed.

2) The flowers mentioned are placed in the most common area in which they are found. They may occur in other areas as well, but are not as common.

3) This area corresponds approximately to the subzone with seral ponderosa pine but lacking seral western larch and the subzone with seral ponderosa pine and western larch of the INTERIOR Douglas-fir Zone as described in the Soils and Vegetation Report of the East Kootenay Area.

TABLE III PLANTS WITH NOTABLE AUTUMN COLOUR IN THE EAST KOOTENAY AREA

The following table presents a listing of some plants that have prominent leaf colour in the autumn. Where found, many of these plants may occur in sufficient quantities to create a blanket of colour. Areas where such a visual display takes place may be considered in the planning of trail or road locations.

This list is subjective to suit the author's taste. Many plants in addition to those listed may cause important contrast and notable colour in particular situations.

The table is divided into plant names and common habitats in which the plant is found. The plant names in the table are ordered alphabetically. The "Common Habitat" column gives a general idea of where the plant may be found. More specific habitat descriptions are not possible because the plants are distributed over a wide range of habitats. Low elevations refers mainly to the valley bottom of the Rocky Mountain Trench. Middle elevations refers to areas between approximately 1000 metres and 2100 metres. High elevations refers to areas above 2100 metres.

COMMON NAME*	COMMON HABITATS
alpine larch	high elevations, (above 2100 metres)
birch-leaved spirea	dry to moist forested areas
black blueberry	moist forested areas, middle to high elevations
black cottonwood	floodplain and riverside areas
blue elder	moist forested areas, logged areas, middle elevations
Canadian bunchberry	moist forested areas
creeping Oregon-grape	low to middle elevations, widespread
grouseberry	moist forested areas and open slopes, middle to high elevations
mallow ninebark	dry forested slopes, middle elevations
pacific menziesia	moist forested areas, middle to high elevations
poison-ivy	disturbed areas
Rocky Mountain maple	moist forested areas
roses	low to middle elevations, widespread
Sitka mountain-ash	moist forested areas, middle elevations
spreading dogbane	disturbed areas and open forested areas
trembling aspen	wide variety of habitats, often on dry, exposed slopes
western larch	middle elevations, widespread
western red-osier dogwood	riverside areas and floodplains
wild sarsaparilla	wet forested areas, riverside areas
willows	riverside areas, mountain slopes, widespread

* plant names used follow
Taylor, R.L. and MacBryde, B.
Vascular Plants of British Columbia
University of British Columbia, 1977

TABLE IV SOME NATIVE POISONOUS AND NUISANCE PLANTS OF THE EAST KOOTENAY AREA

The following table presents some of the more common native poisonous and nuisance plants that may be found in the East Kootenay area. Other plants that are considered to have bothersome qualities may be found but were not considered harmful enough or distributed widely enough to be mentioned in this table.

The table is presented with five headings including "common name", the botanical "Family" in which the plant is placed, a general "Description" of the plant, the "Nuisance Properties" of the plant and the "Common Habitats" in which the plant may be found. The table is ordered alphabetically by common name.

The family names are listed to allow reference to various manuals, especially those published by the British Columbia Provincial Museum. The family name shows the relation of each plant to other plants that may have similar flowers and appearance.

The description of the plant is meant as an aid to identification. Manuals such as C.L. Hitchcock and A. Cronquist, Flora of the Pacific Northwest (1974) and the British Columbia Provincial Museum handbooks for various plant families are useful references for positive identification of any plants thought to be harmful. Under the "Nuisance Properties" heading are listed the plant parts that are considered harmful or bothersome. Weedy plants, plant that have seeds or burrs that stick to clothing and plants with minor harmful qualities were not considered in this table.

Information for this table was freely extracted from the following sources: Wild Flowers of British Columbia (1973), Flora of the Pacific Northwest (1973), The Ferns and Fern-allies of British Columbia (1973), The Lily Family of British Columbia (1974), The Pea Family of British Columbia (1974), The Rose Family of British Columbia (1973), Vascular Plants of British Columbia (1977), Food Plants of British Columbia Indians - Part I/Coastal Peoples (1975).

Table IV) SOME NATIVE POISONOUS AND NUISANCE PLANTS OF THE EAST KOOTENAY AREA

COMMON NAME*	FAMILY*	DESCRIPTION**	NUISANCE PROPERTIES	COMMON HABITATS
common snowberry	honeysuckle	shrub; leaves - bluish-green, paired, and rounded; flowers - pinkish, minute and in scattered clusters; berries - large, soft and white and remaining on bush well into winter	the berries are believed to be poisonous	widespread species from lowland to mid-elevation in mountains
cucumberroot twistedstalk	lily	perennial herb; leaves - ellipse-shaped, pointed and clasping the stem; flowers - single, small, greenish-white flowers hang from a kinked slender stalk beneath each leaf; fruits - elongated, reddish-orange berries which are juicy and slightly translucent	fruits are believed to be poisonous to humans	moist forest and streambanks
currant or gooseberry black swamp gooseberry	currant or gooseberry	erect to sprawling deciduous shrub; leaves - small, maple-like in shape; flowers - small, inconspicuous, usually pinkish to reddish-brown and in drooping clusters; fruit - berries, small, usually dark purple in clusters and covered with conspicuous bristles	usually the stems are covered with thin sharp spines (plus thicker thorns in some species) that produce a serious allergic reaction in some individuals	moist open forests and streambanks; often on rotten stumps and wet rocky cliffs from low elevations to subalpine forests
devil's-club	ginseng	low sprawling shrub (1-3m.) leaves - large, maple-like in shape, spiny along the veins on the underside of the leaves; flowers - small, whitish, in a terminal cluster fruit - bright red, flattened and slightly spiny	spines are present on the veins of the underside of the leaves and on the stem	moist forested areas especially near streams (often found with western red cedar)
Douglas's water-hemlock	parsley	perennial herb; leaves - divided three times then into many small, sharply-toothed leaflets; flowers - small, white and numerous in flattopped "umbrella" clusters; fruit - round with prominent ribs; root - thickened at the base of the stem	the rootstalks contain a poisonous compound	rare, marshes, ditches and wet low places

* plant names used (common and family) follow Taylor, R.L. and MacBryde, B. Vascular Plants of British Columbia, University of British Columbia, 1977

** the plant descriptions used in these tables are only aids to plant identification. See the books and manuals listed for more positive identification.

Table IV) SOME NATIVE POISONOUS AND NUISANCE PLANTS OF THE EAST KOOTENAY AREA (cont'd)

COMMON NAME*	FAMILY*	DESCRIPTION**	NUISANCE PROPERTIES	COMMON HABITATS
elegant death-camas death-camas	lily	perennial herb; leaves - grass-like in shape, mostly arising from the base; flowers - small, cream-coloured and in a tight pointed cluster; fruit - angled seed	poisonous plant, especially the bulbs and seeds	dry meadows and open forests at low elevations
green false hellebore	lily	perennial herb; leaves - large, ellipse-shaped, bright green; flowers - small and green, crowded into an elongated terminal cluster	poisonous plant	wet meadows or forests in subalpine regions
horsetail, scouring-rush dwarf scouring-rush common horestail	horsetail	herb; leaves - small, fused to form a sheath; branches - if present in whorls, growing out through the sheath; reproductive structure - in terminal cones either at the tips of vegetative growth or on specialized reproductive stems	the rhizomatous underground stem can cause this plant to be a garden pest; the green vegetative shoots and fertile shoots are poisonous	railway embankments or roadsides; grassy streambanks and moist woods (dwarf scouring-rush is often found in moist forest areas)
lupines	pea	annual or perennial herb; leaves - alternate, deeply lobed, spreading from one point; flowers - in a cluster, usually purple (sometimes white or blue) petals; fruit - pod, flattened, hairy	lupine rhizomes can be harmful because they contain poisonous compounds	moist, forested areas to subalpine meadows
poison-ivy	sumac	shrub; leaves - shiny, 3 leaflets, ovate and sharp pointed with rounded base (resemble those of Engish ivy); flowers - greenish, white in erect clusters; fruit - white and fleshy	a poisonous oil in all parts of the plant causes severe skin irritation after contact	disturbed areas (has been found near Fairmont Hot Springs and Ram Creek Hot Springs)
ponderosa pine	pine	coniferous tree; leaves - needles in bundles of three; bark- mature trees have a characteristic reddish-orange platy bark	consumption of pine needles can cause abortion in people	low elevation in the Rocky Mountain Trench
red baneberry	buttercup	herb; leaves - paired, terminal leaflets branching from a central stem; flowers - cluster of white flowers; fruit - red berries	the berries are poisonous, paralyzation of the respiratory system occurs after ingestion of only a small amount	moist, forested areas

* plant names used (common and family) follow Taylor, R.L. and MacBryde, B. Vascular Plants of British Columbia, University of British Columbia, 1977

** the plant descriptions used in these tables are only aids to plant identification. See the books and manuals listed for more positive identification.

Table IV) SOME NATIVE POISONOUS AND NUISANCE PLANTS OF THE EAST KOOTENAY AREA (cont'd)

COMMON NAME*	FAMILY*	DESCRIPTION**	NUISANCE PROPERTIES	COMMON HABITATS
rose baldhip rose prickly rose Woods' rose	rose	erect shrubs (up to 2m. tall); leaves - 5-9 leaflets more or less elliptic; stem - very bristly with slender prickles; flowers - petals - red; fruit - rose hips, bright red	spiny stems	dry to moist forests from low to middle elevations
American stinging nettle	nettle	herb; leaves - ragged, in opposite pairs, taper to a point; flowers - green, inconspicuous, clustered in drooping bunches at the base of the leaf stem	leaves and stem are covered with stiff hairs which cause stinging and blistering	edges of clearing and in wet meadows at low elevations
thistles	aster	herb; leaves - alternate , jagged and spiny; flowers - usually purple (sometimes reddish to yellowish or white); fruit - dry indehiscent fruit	spines are present on the leaves, flowerhead bracts, and along the stem in some species	roadsides and wasteland
western yew	yew	shrub-like tree; bark - reddish, thin and scaly; needles - flattened with pointed tips and in two rows along the stem; branches resemble hemlock branches; fruit - male and female reproductive structures are on different trees; male trees produce minute yellowish cones; female trees produce round, pinkish-red berries on the underside of the branches	leaves and berries when consumed are poisonous	moist forests commonly found on wet slopes (has been found south of Fernie)

* plant names used (common and family) follow Taylor, R.L. and MacBryde, B. Vascular Plants of British Columbia, University of British Columbia, 1977

** the plant descriptions used in these tables are only aids to plant identification. See the books and manuals listed for more positive identification.

PLANT SPECIES USED IN TABLES*

Common Names	Botanical Names
alpine Indian paintbrush	Castilleja rhexifolia
alpine larch	Larix lyallii
American red raspberry	Rubus idaeus
American stinging nettle	Urtica dioica
antelope bush	Purshia tridentata
arrow-leaved balsamroot	Balsamorhiza sagittata
arrow-leaved ragwort	Senecio triangularis
baldhip rose	Rosa gymnocarpa
bear-grass	Xerophyllum tenax
birch-leaved spirea	Spiraea betulifolia
bitteroot lewisia	Lewisia rediviva
black blueberry	Vaccinium membranaceum
black cottonwood	Populus balsamifera subsp. trichocarpa
black swamp gooseberry	Ribes lacustre
blue-bead clintonia	Clintonia uniflora
blue elder	Sambucus cerulea
blue-leaved cinquefoil	Potentilla diversifolia
blue-leaved wild strawberry	Fragaria virginiana
broad-leaved arnica	Arnica latifolia
broad-leaved willowherb	Epilobium latifolium
brown-eyed Susan	Gaillardia aristata
Canadian bunchberry	Cornus canadensis
Canada violet	Viola canadensis
choke cherry	Prunus virginiana
clover	Trifolium spp.
common cattail	Typha latifolia
common cow-parsnip	Heracleum sphondylium
common dandelion	Taraxacum officinale
common harebell	Campanula rotundifolia
common horsetail	Equisetum arvense
common juniper	Juniperus communis
common labrador tea	Ledum groenlandicum
common pink pyrola	Pyrola asarifolia
common rabbitbrush	Chrysothamnus nauseosus
common saskatoon	Amelanchier alnifolia
common silverweed	Potentilla anserina
common snowberry	Symphoricarpos albus
common western pipsissewa	Chimaphila umbellata
cream-coloured peavine	Lathyrus ochroleucus
cream mountain-heather	Phyllodoce glanduliflora
creeping Oregon-grape	Mahonia repens
cucumberroot twistedstalk	Streptopus amplexifolius
currant	Ribes spp.
death-camas	Zigadenus venenosus
devil's-club	Oplopanax horridus
Douglas' aster	Aster subspicatus
Douglas' water-hemlock	Cicuta douglasii
dwarf blueberry	Vaccinium caespitosum
dwarf scouring-rush	Equisetum scirpoides
early blue violet	Viola adunca
elegant death-camas	Zigadenus elegans
English ivy	Hedera helix
evergreen yellow violet	Viola orbiculata

PLANT SPECIES USED IN TABLES* (cont'd)

Common Names	Botanical Names
false salsify	Tragopogon dubius
false Solomon's-seal	Smilacena racemosa
few-flowered shooting star	Dodecatheon pulchellum
field mint	Mentha arvensis
fireweed	Epilobium angustifolium
fringed grass-of-parnassus	Parnassia fimbriata
gooseberry	Ribes spp.
great mullein	Verbascum thapsus
green false hellebore	Veratrum viride
green pyrola	Pyrola chlorantha
grouseberry	Vaccinium scoparium
hairy golden aster	Heterotheca villosa
heart-leaved arnica	Arnica cordifolia
high bush cranberry	Viburnum edule
horsetail	Equisetum spp.
Indian paintbrush	Castilleja spp.
kinnikinnick	Arctostaphylos uva - ursi
lodgepole pine	Pinus contorta
lupines	Lupinus spp.
Lyall's goldenweed	Haplopappus lyallii
mallow ninebark	Physocarpus malvaceus
Merten's cassiope	Cassiope mertensiana
Montana delphinium	Delphinium bicolor
moss campion	Silene acaulis
mountain cranberry	Vaccinium vitis - idaea
mountain forget-me-not	Myosotis asiatica
mountain lady's-slipper	Cypripedium montanum
mountain sorrel	Oxyria digyna
nodding onion	Allium cernuum
northern gentian	Gentianella amarella
northern twinflower	Linnaea borealis
old man's whiskers	Geum triflorum
one-flowered wintergreen	Moneses uniflora
orange false dandelion	Agoseris aurantiaca
oxeye daisy	Leucanthemum vulgare
Pacific anemone	Anemone multifida
parsnip-flowered umbrellaplant	Eriogonum heracleoides
poison-ivy	Toxicodendron rydbergii
ponderosa pine	Pinus ponderosa
prairie crocus	Pulsatilla patens
prickly rose	Rosa acicularis
purple mountain saxifrage	Saxifraga oppositifolia
pussytoes	Antennaria spp.
red baneberry	Actaea rubra
red mountain-heather	Phyllodoce empetriformis
Rocky Mountain juniper	Juniperus scopulorum
Rocky Mountain maple	Acer glabrum
Rocky Mountain ragwort	Senecio streptanthifolius
rose	Rosa spp.
rough-fruited fairybells	Disporum trachycarpum

PLANT SPECIES USED IN TABLES* (cont'd)

Common Names	Botanical Names
scouring-rush	Equisetum spp.
shaggy fleabane	Erigeron pumilus
short-beaked false dandelion	Agoseris glauca
showy aster	Aster conspicuus
shrubby cinquefoil	Potentilla fruticosa
shrubby penstemon	Penstemon fruticosus
silky phacelia	Phacelia sericea
Sitka columbine	Aquilegia formosa
Sitka mountain-ash	Sorbus sitchensis
Sitka valerian	Valeriana sitchensis
slender hawk's-beard	Crepis atrabarba
small yellow lady's-slipper	Cypripedium calceolus
smooth Pacific menziesia	Menziesia ferruginea
snowbush ceanothus	Ceanothus velutinus
soopolallie	Shepherdia canadensis
spreading dogbane	Apocynum androsaemifolium
star-flowered false Solomon's-seal	Smilacena stellata
subalpine fleabane	Erigeron peregrinus
sulphur-flowered umbrella plant	Eriogonum umbellatum
sulphur hedysarum	Hedysarum sulphurescens
thistles	Cirsium spp.
three-spot mariposa lily	Calochortus apiculatus
trembling aspen	Populus tremuloides
twinberry honeysuckle	Lonicera involucrata
unifoliate-leaved foamflower	Tiarella unifoliata
Utah honeysuckle	Lonicera utahensis
western blue clematis	Clematis occidentalis
western larch	Larix occidentalis
western pasqueflower	Pulsatilla occidentalis
western red-osier dogwood	Cornus sericea
western spring beauty	Claytonia lanceolata
western thimbleberry	Rubus parviflorus
western yew	Taxus brevifolia
white-flowered rhododendron	Rhododendron albiflorum
white globeflower	Trollius laxus
white marsh-marigold	Caltha leptosepala
white mountain-avens	Dryas octopetala
wild sarsaparilla	Aralia nudicaulis
willow	Salix spp.
wood lily	Lilium philadelphicum
Woods' rose	Rosa woodsii
wood strawberry	Fragaria vesca
woolly pussytoes	Antennaria lanata
yellow glacier lily	Erythronium grandiflorum
yellow penstemon	Penstemon confertus
yellow wood violet	Viola glabella

* Plant names follow Taylor, R.L. and MacBryde, B., Vascular Plants of British (1977)

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Appendix G

DUCKS UNLIMITED WATERFOWL ENHANCEMENT PROJECTS

(Southern Section of Rocky Mountain Trench)

1. Reed Lakes - Lat. 49°49' Long. 115°48'
Completed 1971
Area: ca. 100 ac.
Landownership: Crown - L.8105
Water source: Reed Creek
Comments: The permanency of four grassland basins was increased by conserving spring run-off flow.

2. Elizabeth Lake - Lat. 49°29' Long. 115°47'
Completed 1972
Areas: 250 ac.
Landownership: Crown - portion of L.17 and L.31
City of Cranbrook - L.30 Plan 887
Water source: Jim Smith Creek
Comments: The permanency of this lake was secured and internal works were carried out to increase the amount of open water and to provide secure nesting sites.

3. Bummer Flats - Lat. 49°40' Long. 115°40'
Completed 1974
Area: 775 ac.
Landownership: Crown - L.129
Water source: Saugum Creek and the Kootenay River
Comments: The permanency of the existing waterfowl habitat was secured, and the uplands are managed as a multiple use project for cattle and wildlife by the Fish and Wildlife Branch - Region IV.

4. Waterfowl Oxbows - Lat. 49°50' Long. 115°43'
Completed 1975
Area: 50 ac.
Landownership: Crown - L.125
Water source: Mayook Creek and the Kootenay River
Comments: Earth works were constructed to stabilize the water levels in several irregular basins on the floodplains. This project was designed to provide multiple-use as waterfowl habitat, stock water, and a possible source for irrigation water.

5. Three Sons Project - Lat. 49°50' Long. 115°43'
Completed 1975
Area: ca. 100 ac.
Landownership: Private - L.15
Three Sons Investment Ltd.
Box 6207, Calgary, Alberta
Water source: Wolf Creek
Comments: This floodplain development was a joint project with the landowner, who presently manages the water levels and is responsible for maintenance.

6. Saugum Creek - Lat. 49°42' Long. 115°39'
Completed 1977
Area: 85 ac.
Landownership: Crown (n. or L.3040)
Water source: Saugum Creek
Comments: Cr. deep, narrow, basin was flooded to serve as a reservoir for downstream irrigation and for regulation of flow to Bummers Flats. This project was also designed to act as an attraction area for nearby nesting habitat.

7. Spring Lakes - Lat. 49°24' Long. 115°21'
Completed 1978
Area: 48 ac.
Landownership: Crown
Water source: Local run-off and ground springs
Comments: The permanency of this waterfowl habitat will be increased by conserving spring run-off flow.

Source: Information supplied by R.J. Sterling, Provincial Biologist, Ducks Unlimited (Canada), Kamloops, B.C.

Appendix H

GLOSSARY

ALLUVIAL (FLUVIAL) FANS
Fan consisting chiefly of fluvial gravels and sand.

ARGILLITE
A fine-textured rock that has undergone a somewhat higher degree of induration than is present in siltstone, claystone, or shale; argillite holds an intermediate position between those rocks and slate; cleavage is approximately parallel to bedding.

BRAIDED CHANNEL
A stream flowing in several channels that divide and reunite; resembling strands of a braid.

CHERT
A compact, siliceous rock formed of chalcedonic or opaline silica, one or both, and of organic or precipitated origin. Chert occurs distributed through limestone, affording cherty limestones. Flint is a variety of chert.

CIRQUE
Formed by glacial erosion, and consisting of a rounded basin, partially enclosed by steep cliffs and may contain a small lake (tarn) or cirque glacier.

CLIMATE NETWORK
Dense local network consisting of (40-45) stations; run for a period of three years to facilitate the generation of reconnaissance level climatological maps.

COKING (COAL)
Method of destructive distillation used to produce coal residue for fuel.

COLLUVIUM
Material that has moved downslope due to gravity; includes landslide deposits, talus material and earthflows.

DOLOMITE
A carbonate mineral of composition $CaMg(CO_3)_2$, calcium-magnesium carbonate; where this predominates, the rock itself is called dolomite.

DRIFT
A collective term for all unconsolidated materials associated with glaciation.

DRUMLIN
A streamlined hill or ridge composed of glacial till with long axis paralleling the direction of flow of a former glacier; long profile is typically asymmetrical with the steep side facing up-glacier, thus enabling the direction of ice movement to be determined.

ESCARPMENT
Steep face extending laterally for some distance.

FAULT SCARP
A cliff formed by a fault.

FEN
Sedge peat materials derived primarily from sedges with inclusions of partially decays stems of shrubs formed in a eutrophic (well-nourished) environment due to the close association of the material with mineral rich waters.

FLOODPLAIN
Flat area adjacent to river that is periodically flooded.

FLUVIAL
Pertaining to rivers and streams.

FOSSILS
The remains or traces of animals or plants which have been preserved by natural causes in the earth's crust exclusive of organisms which have been buried since the beginning of historic time.

GEOLOGICAL PROCESSES
The chemical and physical interactions between natural forces and the earth's surface which modify the earth's surface form, e.g., erosion by water, landsliding, weathering.

GLACIOLACUSTRINE
Pertaining to lakes dammed by glaciers; refers to lacustrine sediments deposited close to glacier ice.

GULLIES
Parallel and sub-parallel steep-sided and narrow ravines across the land surface developed as a result of fluvial erosion. Gullies ordinarily carry water only during and immediately after rains and snowmelts.

HISTORIC TIME
Usually refers to the period following the initial appearance of written records with respect to a specific cultural group (or groups). In the East Kootenay region, historic time dates from approximately 1800 A.D.

HOODOOS
Pillars developed by erosion of horizontal strata of varying hardness in regions where most rainfall is concentrated during a short period of the year.

HOT SPRINGS
Thermal spring; a spring with water above 38°C.

HUMMOCKY MORAINE
Area of glacial knob and kettle topography; may have been produced by either live or stagnant ice.

KARST
Landforms resulting from solution of carbonate rocks

KETTLE
A small hollow or depression formed in glacial deposits where outwash was deposited around a residual block of ice, that later melted.

KRUMMHOLZ
An area of sporadically-distributed tree cover, the tree species being subalpine, and the trees themselves being stunted in varying degrees. Tree clumps are often interspersed with alpine-tundra-like openings, or with other types of vegetation dominated by herbs and/or shrubs.

LACUSTRINE
Pertaining to lakes.

LIMESTONE
A sedimentary rock consisting chiefly of calcium carbonate, it is the consolidated equivalent of limy mud, calcareous sand, or shell fragments.

MARSHES
Grassy, herb-dominated, wet areas which are periodically inundated up to a depth of two meters with standing or slowly moving water. Marshes may be bordered by peripheral bands of trees and shrubs, but the predominant vegetation consists of a variety of emergent non-woody plants such as rushes, reedgrasses and sedges. Where open water areas occur, a variety of submerged and floating aquatic plants flourish.

MEANDERING CHANNEL
Section of a stream containing broad semicircular curves that develop as a stream erodes the outer bank of a curve and deposits sediment against the inner bank; as this progresses the

meander bends grow, until eventually the channels meet, causing the intervening meander loop to be pinched off and abandoned thus forming a cut-off or oxbow lake.

MINERAL LICKS
Localized areas of salt accumulation that ungulates use as nutrient supplement.

MITIGATE
Reduce severity of.

MORAINE
Material deposited directly by glaciers; lateral - at the side; terminal - at the end.

PASSERINE
Of or relating to the largest order (Passeriformes) of birds which includes more than half of all living birds and consists chiefly of songbirds of perching habits.

PETROGLYPH
A carving or inscription in a rock.

PHYLLITE
A metamorphic rock which consists of clay-sized particles and which is intermediate in level of metamorphism between a slate and a schist. As with schists, the constituent minerals of phyllites have a distinctly aligned platy orientation.

PICTOGRAPH
An ancient or prehistoric drawing or painting on a rock wall.

PIT HOUSE
Semi-subterranean, circular structure with an earth-covered roof built over a timber frame.

PLACER
A place where gold is obtained by washing; an alluvial or glacial deposit, as of sand or gravel, containing particles of gold or other valuable minerals.

PLEISTOCENE EPOCH
The earlier of the two epochs which together constitute the Quaternary Period. The Pleistocene Epoch corresponds generally with the period of repeated glaciations which have occurred during the last few million years.

POINT BAR
A sediment deposited by a stream on the inside of a meander bend.

PREHISTORIC TIME
Usually refers to the period prior to the initial appearance of written records with respect to a specific cultural group (or groups). In the East Kootenay region, prehistoric time extends from at least as far back as 9000 B.C. to approximately 1800 A.D.

QUARRY
An open or surface working, usually for the extraction of building stone, as slate, limestone, etc.

QUARTZITE
A tough massive rock consisting almost wholly of quartz and usually having a pale colour; product of metamorphism of pure sandstone.

QUATERNARY
The most recent geological time period, subdivided into the Pleistocene and Recent Epochs.

REACH (RIVER REACH)
The basin biophysical mapping unit of the aquatic systems inventory. The reach is characterized by relatively homogeneous properties which will vary according to the scale of the survey, and which include slope, channel and/or biological parameters.

SHALE
A thinly-bedded sedimentary rock with predominantly clay-sized particles.

SINKHOLE
A funnel-shaped depression in the land surface generally in a limestone region communicating with a subterranean passage developed by solution. Sinkholes may also result from a solution of gypsum and rock salt.

SOIL ASSOCIATION
A sequence of soils of about the same age, derived from similar parent materials and occurring under similar climatic conditions. Individual soil units within a soil association are differentiated on the basis of relief and drainage.

STAGING AREAS
Locations where waterfowl concentrate prior to and during migration.

SUMMER RANGE
Areas utilized by wildlife in the non-winter seasons, usually high elevation mountain areas.

TALUS
Angular rock fragments that accumulate from rockfall at the foot of cliffs.

UNGULATE
Hoofed animals, including members of the sheep and goat family (bighorn sheep, mountain goat) and of the deer family (moose, elk, woodland caribou, mule deer, and white-tailed deer).

VARVE
Any sedimentary bed or lamination that is deposited within one year's time.

WATERSHED
The area drained by a particular stream or lake.

WETLANDS
Land or areas (as tidal flats or swamps) containing much soil moisture.

WINTER RANGE
Is an area where ungulates concentrate in the winter, usually occurring in low elevations.

Appendix I

ORIGINS OF PLACE NAMES

Akamina	Indian name meaning "half benchland".
Assiniboine (Mount)	after the Assiniboine (Stoney) Indians, who hunted in the Rockies. Means: "those who cook by placing hot stones in water". Named by G.M. Dawson.
Athalmer	originally known as "Salmon Beds". A civil engineer with an aristocratic English background, the Hon. G.W. ("Fred") Aylmer, aware that his surname was derived from the Anglo-Saxon "athel" meaning "noble", and "mere" meaning "lake", called the settlement Athalmer in honour of his ancestors and himself.
Brewery Creek	a brewery was situated here at one time.
Canal Flats	this expanse of low ground separating the Kootenay River from Columbia Lake (source of the Columbia River) was originally named "McGillivray's Portage" by David Thompson, who passed this way in 1808. Its present name commemorates the canal, parts of which can still be seen, completed in 1889 by William Adolph Baillie-Grohman, British sportsman and capitalist. This canal was part of a scheme to divert some of the water of the upper Kootenay River into the Columbia system and thus to lower the level of Kootenay Lake sufficiently to reclaim the rich alluvial plain adjacent to Creston. Under pressure from settlers around Golden who feared their hay meadows would be flooded, the Canadian government modified the original plans so much as to render the canal useless. Baillie-Grohman finally abandoned the whole project in disgust. In 1894 the Gwendoline and in 1902 the North Star successfully passed from the Kootenay River to the Columbia using Baillie-Grohman's canal.
Columbia River	first named the Rio de San Roque by Heceta, who discovered the river's mouth in 1775. It was rediscovered in 1792 by Captain Robert Gray, an American, who named it after his ship, the "Columbia".
Connor Lakes	after a trapper and prospector.
Corbin	after David Chase Corbin of Spokane, Washington, capitalist and railway builder, owner of Corbin Coal and Coke Company.
Cranbrook	the area around Cranbrook was formerly known as Joseph's Prairie and here the Kootenay Indian village of A'ghis ga' ktlut once stood. An early colonist, Colonel James Baker, at one time provincial Minister of Education, settled here in 1885 and named his estate Cranbrook Farm, after the little Kentish town of Cranbrook from which he came. When a townsite was laid out in 1897 the name of Cranbrook was taken for the new settlement. Cranbrook became important as a divisional point after the opening of the C.P.R.'s Crowsnest line in 1898, and was incorporated as a city in 1905.
Crowsnest Pass	in very early days a band of Crow Indians, making a horse-stealing raid into Blackfoot territory, camped here. The Blackfeet, catching them by surprise in their "nest", massacred them. A Palliser Expedition map of 1859 shows "lodge des Corbeaux" at the head of the "Crow River". Another map of the same expedition in 1860 shows "Crows Nest" river and pass. Captain Palliser, the first white man to learn of the pass, referred to it at times at the "British Kutanie pass". Crowsnest became a C.P.R. divisional point during the building of the railway's Crowsnest line in 1897.
Daer Creek	(also, Daer Mountain). From Lord Daer, the title of the son and heir of the Earl of Selkirk.

Elk River	David Thompson's "Stag River". Thompson did not make the common error of confusing the North American wapiti with the European elk.
Elko	founded in 1905 and named after the Elk River on whose banks it stands.
Fairmont Hot Springs	Indians and white men passing through the country bathed in the hot springs here long before Mr. and Mrs. Brewer, around 1898, built their Fairmont Hotel, a log house within a half a mile of the springs.
Fernie	originally Coal Creek. Named after William Fernie (1837? - 1921). Prospecting in 1887, Fernie discovered coal in one of the tributaries of Michel Creek and later on in the Elk River Valley and adjacent areas. He became wealthy through subsequent association with the Crowsnest Pass Coal Company.
Fisher (Mount)	after Jack Fisher who discovered gold in Wild Horse Creek in 1863. The mining camp which sprang up here after this discovery was named Fisherville.
Flathead River	after the Flathead Indians who dwell in this district. The Flathead river was once known as Clark's River.
Fording River	given this name by G.M. Dawson in 1884, because the trail frequently crossed and recrossed the stream, requiring much fording.
Fort Steele	originally named Galbraith's Ferry, after John Galbraith who ran a ferry across the Kootenay River here. Renamed after Major-General Sir Samuel Steele of the North West Mounted Police, who was brought into the area in 1887 to quell a possible Indian disturbance.
Gibraltar Rock	(should be "Gibraltar Cliff") - cliff-like rocks which go straight down to the Kootenay River on both banks.
Grasmere	earlier named "McGuire" after Howard McGuire who arrived in the district in 1898. In 1922 when a new school was built, every pupil submitted a new name. A draw was held, and the entry which was picked was that of young Warren Lancaster, who had proposed "Grasmere".
Grave Creek	named after two Indian graves near its mouth.
Hahas Lake	Indian word for "skunk" (other names for the lake are: Stevens and Lazy).
Hosmer	after Charles A. Hosmer, at one time manager of the C.P.R. telegraph system, and a director of the railway.
Invermere	In 1890 in consequence of some local mining excitement, Edmund T. Johnson laid out a townsite here and named it Copper City. In 1900 the Canterbury Townsite Company took over the site and renamed it after the famous cathedral city in England. Finally, the Columbia Valley Irrigation Fruit Lands Company acquired the site and the name was changed to Invermere by the Hon. R. Randolf Bruce. The name Invermere means "at the mouth of a lake".
Jaffray	(formerly Cranston) named after Robert Jaffray, president of Cariboo-McKinney Gold Mining and Milling Company.
Kikomun Creek	(formerly Galloway, Rock, Kitamin, Kokamun, Mud) from Indian word "ka-ko'kum-e" which may mean "mud".
Kimberley	Much uncertainty surrounds the origin of this name. It appears likely, however, that Colonel Ridpath, an American mining magnate, conferred the name in 1896 or 1897, presumably hoping that his property here would prove as rich as the diamond mining centre of Kimberley in South Africa.

Kishinena	from the Indian word for "White fir" or "Balsam".
Kootenay River	from the Kootenay (Kootenai, Kootenae, Coutonai, Kutenai) Indians, whose name is derived from "co", meaning "water", and "tinneh", meaning "people".
Michel	almost certainly after Chief Michel of the Kootenay Indians, although some local historians maintain that the origin of Michel was from Michael Phillips, H.B.C. clerk at Fort Shepard in 1864, who was one of the first white settlers in the Crowsnest district.
Mitchell Range	(also Mitchell River) after Captain Mitchell, travelling companion of Captain Arthur Brisco when the latter was connected with the Palliser explorations during 1859.
Morrissey	named after James Morrissey who with Michael Phillips and John Ridgway cut out the Crowsnest Pass trail, from site of present Elko to Crowsnest Lake.
Moyie River	(also Moyie Lake and Moyie) David Thompson named the Moyie river "McDonald's River" after his clerk, Finan McDonald, while Governor Simpson called it "Grand Quete" in honour of an Indian chief. The name "Moyie" or "Mooyie" is a very old one, however, and is a corruption of the French "Mouille" meaning "wet".
Natal	apparently named at the time of the Boer War (1899-1902), in honour of the British crown colony of Natal.
Newgate	(formerly Gateway) International U.S.-Canada boundary site of railway station and customs office
Norbury Lakes	after the Hon. F. Paget Norbury, an Englishman who ranched in this district in the 1890's.
Palliser River	after Captain John Palliser (1817-87), who under direction of the British government spent the period 1857-59 exploring the country between the 49th parallel and the North Saskatchewan River, and between the Red River and the Rockies. He was also charged with seeking for passes through the Rockies, and this extension of his duties took him into British Columbia.
Perry Creek	after Frank Perry, or Francois Perrier, a French-Canadian half-breed who discovered gold here in 1867 or 1868.
Phillips Creek	after Michael Phillips, originally an H.B.C. clerk at Fort Kootenay. He married Rowena, daughter of Chief David of the Tobacco Plain Indians and later became the first homesteader in the district, and the first Indian Agent in the area.
Purcell Mountains	named by Dr. James Hector after Goodwin Purcell (1817-76). Purcell, the last chieftan of the O'Leary line, was also Professor of Therapeutics and Medical Jurisprudence at Queen's University, Cork. He had been on the selection committee which had chosen the personnel for the Palliser expedition with which Hector was serving.
Radium Hot Springs	these were originally knowns as "Sinclair Hot Springs". In 1915 the name was changed to Radium Hot Springs, due to the unsually high radioactivity in the water here.
Rocky Mountains	the earliest reference to these is that of John Knight, governor of York Factory who, in his diary for 1716, states that Indians had told him that very far to the west there were prodigious (I bet they didn't use that word!) mountains. First mention of their present name is to be found in Legardeur St. Pierre's journal for 1752, which refers to the "Monagnes de Roche". "Rocky Mountains" is a translation of the Cree Indian name for them, "as-sin-wati".

St. Eugene Mission	when Father Leon Fouguet founded this mission in 1874, he named it after a namesaint of the founder of his order, Charles Joseph Eugene de Mazenod (1782-1861), Bishop of Marseilles.
St. Mary River	named after the Blessed Virgin Mary, patron saint of his order, by Father Fouguet, O.M.I., who found St. Eugene Mission on this river in 1874.
Simpson Pass	(also Simpson River) after Sir George Simpson (1792-1860), governor of the H.B.C. in Canada 1822-60. Simpson Pass through the Rockies was discovered by a party headed by Governor Simpson in 1841.
Sinclair Canyon	was known to the Indians as red rock gorge, but took its present name from James Sinclair (1805-56) who, in 1841, led a party of emigrants through this passage. Sinclair was a "free trader", one of those who operated outside the Hudson's Bay Company's monopoly of the fur trade. He was also a champion of the half-breed *metis* in their struggle with the Company.
Skookumchuck	in the Chinook jargon "Skookumchuck" means "turbulent water" or "rapid torrent" (Skookum = strong; chuck = water).
Sparwood	the trees near this settlement proved suitable for "spars" for ships.
Ta Ta Creek	a legend exists whereby "Shorty" McLeod shot and killed a "tinhorn card shark" and was caught and arrested by a constable. Shorty gave the officer breakfast, disarmed him and escaped on his horse. He rode off crying: "Well, Corporal, ta ta!" and headed to the U.S. (Fred Smyth - "Tales of the Kootenays").
Tobacco Plains	the Indians used to grow a kind of native tobacco here. It was apparently a long-established name when Father de Smet used it in the mid-nineteenth century.
Wardner	after James F. ("Jim") Wardner who founded the town in 1895.
Wasa	named by Nils Hanson after Vasa, a coastal town in his native Finland. Nearby Wasa Lake was formerly Hanson Lake.
White Man Pass	the Indian name for the pass. The first white man to use it was James Sinclair who led a party of emigrants through it in 1841 on their way to Oregon. He was followed in 1845 by Father de Smet who set up a wooden cross at the summit.
Wigwam River	this tributary of the Elk was so named because Indians travelling to or from the North Kootenay Pass used to camp beside the stream.
Wild Horse Creek	David Thompson, who called the stream "Skirmish Brook", mentioned the herds of wild horses to be found in this country as early as the beginning of the 19th century. The creek seems to have been given its present name by Jack Fisher, leader of the party of miners who found gold here in 1863. Fisher's eye was caught by a white horse on a hillside and consequently he named the stream either "Stud Horse Creek" or "Wild Horse Creek". The latter name soon became universally used. The Geographic Board of Canada later promoted the creek to a river.
Windermere Lake	this was David Thompson's "Kootenae Lake" near which he founded Kootenae House in 1807. It was subsequently known as Marigeau Lake and as Lower Columbia Lake. It was given its present name in 1883 by G.M. Sproat because of its resemblance to Lake Windermere in the English Lake district.
Yahk	(also Yahk River) from the Indian word "yaak" meaning "bow", a name which the Kootenay Indians applied to the Kootenay River which first flows south, then west, then north. Some derive the name from "a'k" meaning "arrow".

Note Regarding Sources

The main data sources were 1001 British Columbia Place Names, by G.P.V. and Helen B. Akrigg, and the Geographic Names Office, Mapping and Surveys Branch. The latter maintains a current card index for all place names in the province.

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